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Dell Dimension™ T Series[8] photographed with options: 17" flat panel monitor and Altec Lansing ADA 880 speakers.

Dell Inspiron™ 5000

Dell Precision™ 220 pictured with optional 17" flat panel monitor

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AWARDS

Australian PC Buyer
November. The Dell Dimension L500c was rated #1 in the Value Desktop Category.
December. The Dell Dimension L500c was rated #1 in the Business PC category.

Australian PC World
November. The Dell Dimension T500 won #1 in the Home Best Buy category.
January 2000- Dell Dimension XPS T700 was rated second in "Best Home and Business PC"
January 2000 - Dell Dimension L500c was ranked second in "Best Business PC Buy"

Top products of 1999
The Dell Dimension XPS T500 was rated The Best Home PC of 1999 by the editor and readers alike.

Australian PC Authority
T550 won a "Recommended Award."
December. The Dell Dimension T550 won a "Recommended Award."
January 2000- Dell Dimension XPS T550 was named "Ultimate PC".
February 2000- Dell Dimension XPS T550 received the recommended award for the ninth month in a row.
February 2000 - Dell Inspiron 3700 awarded Excellence Award
February 2000 - Dell Dimension XPS B733 received the speed award in the Super PCs category

Internet .au
April 2000- rated the Dell Latitude LS as top of its "Hot Products" section

Australian Personal Computer
December. The Dell Dimension T500 won "Editors Choice Award."

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pc world

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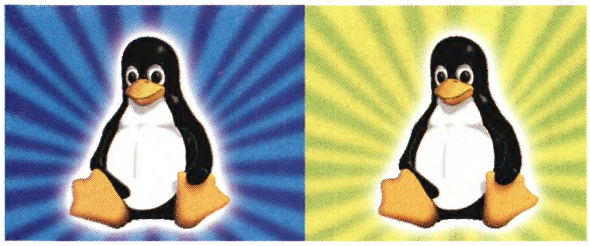

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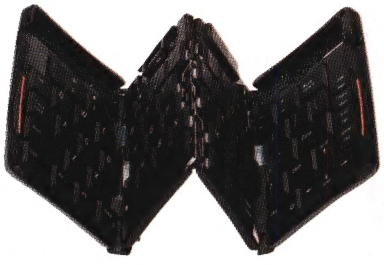

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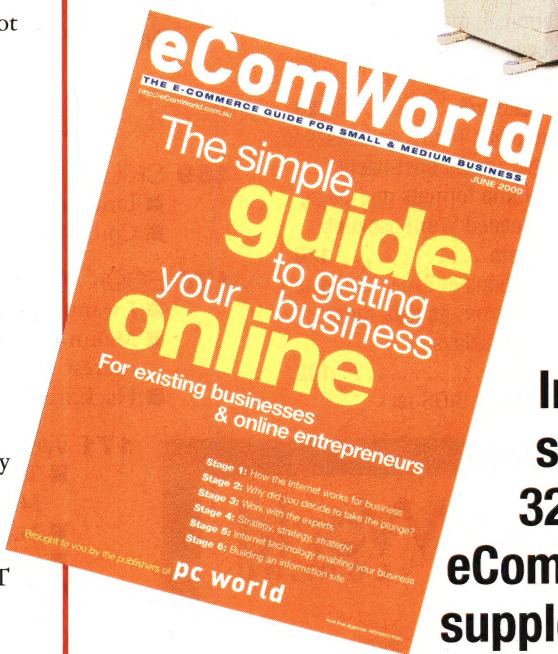

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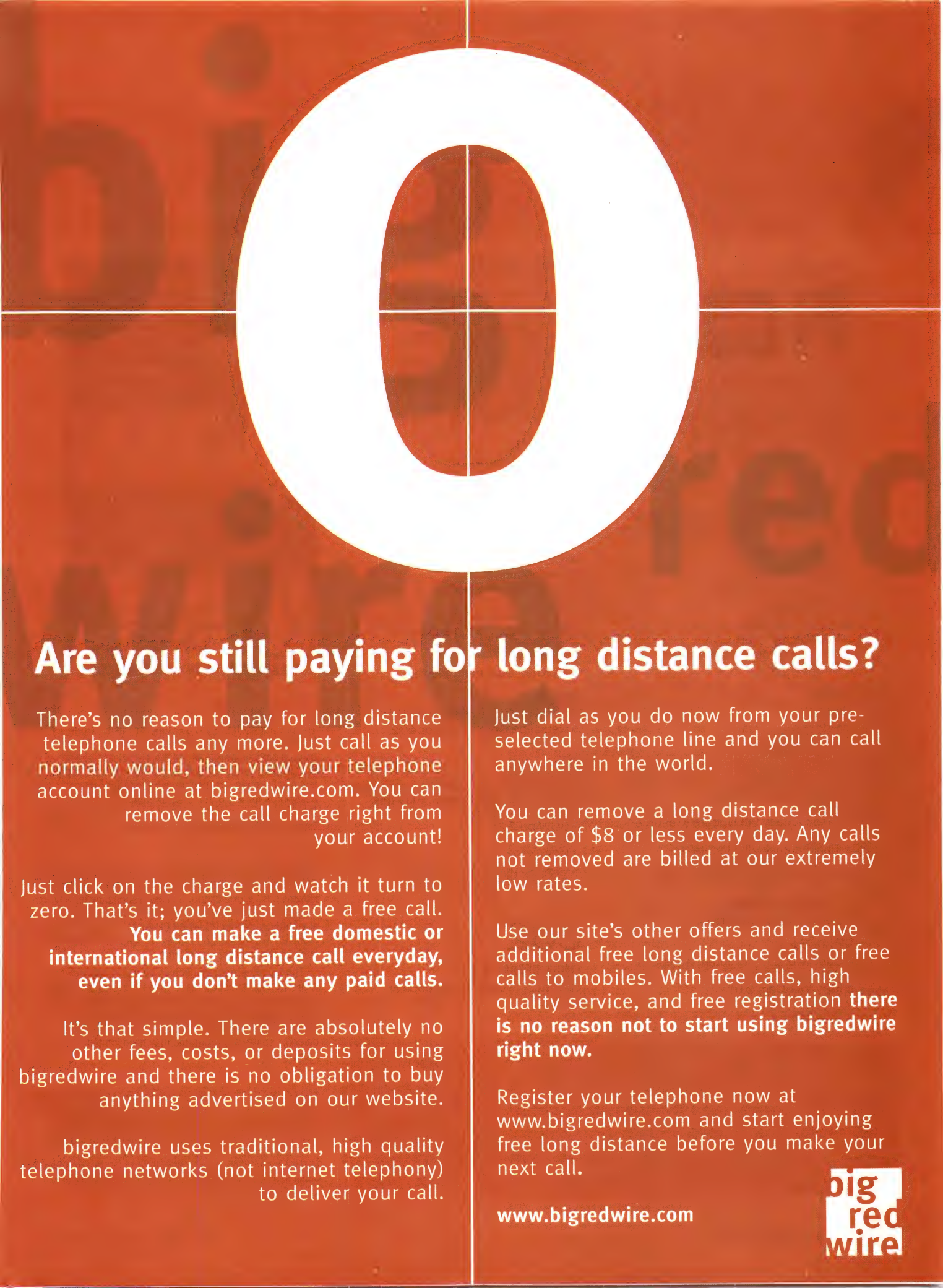
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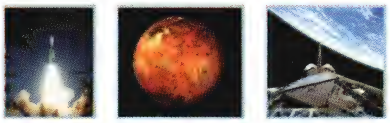

NASA PHOTOS OF THE SOLAR SYSTEM

From early Voyager missions to the latest Hubble images – a hand-picked collection of over 120 stunning pictures of the solar system including the planets, moons, asteroids and comets. Free for non-commercial use.

TOP SHAREWARE

Cookie Monsters

These 10 tools will help you manage cookies while improving security and protecting privacy.

- AdsOff 2.0
- AdSubtract SE 1.64
- Cookie Cruncher
- Cookie Crusher 2.5d
- Cookie Pal 1.5
- Cookie Web Kit
- History Kill 2000
- NetWatcher 2000
- Norton Internet Security 2000
- SurfSecret 2

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- Evolva
- Let's Dogfight
- Metal Fatigue
- Pinky and the Brain: World Conquest
- Superbike 2000
- Sheep Shooter (free)

Patches:

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- Final Fantasy VIII Update
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- IomegaWare 2.2.1
- Logitech Mouse Driver Update 9
- MS Intellimouse Drivers 3.1
- MS Office 97 Patch SR-1
- MS Office 97 Patch SR-2b
- PageMill 3.0.1 Update
- Paint Shop Pro 6.02 Upgrade
- TrendMicro Virus Signature (677)
- Windows 2000 – Iomega Tools compatibility patch
- Windows NT4 SP6a

ESSENTIALS

- Acrobat Reader 4.05
- Arachnophilia 4.0 (5277)
- CuteFTP 4.0
- DirectX 7.0a
- Eudora Pro 4.3
- GetRight 4.1.2
- IrfanView 3.15
- ICQ 99b (ver 3.19)
- MusicMatch 5.00
- Paint Shop Pro 6.02
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- WinAmp 2.6.1
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- Word 97 Document Viewer

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- Microsoft Internet Explorer 5.01
- Netscape Communicator 4.72
- Navigator 4.08

HELPSCREEN

Full archive: over 2000 tips from 4 years of PC World Help Screen. Plus this month's programs:

- BCWipe 2.28
- KillWin 2.1.6
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- Remote Disconnetion Utiltiy

cd2

LINUX REDHAT 6.2

The latest release of this popular distribution.

FREE OPERATING SYSTEM SPECIAL

Run THREE OSes on your PC. See page 114 to learn how.

BeOS 5 PERSONAL EDITION

Easy installation direct from Windows 95/98/NT/2000

and

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The latest version of this popular Linux distribution.

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abc 55,506 December 1999

WINNERS of the Dynalink TView and FMSystem competition on page 133 of April PC World are:

J. Loke, South Australia; and A. Anderson, Queensland.

Congratulations and thanks to everyone who entered.

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invent

Many small and medium businesses today are afraid that they've missed the chance to jump on the e-commerce bandwagon. Don't worry, it's not too late — and if you want to stay competitive, it's vital.

E-commerce solutions?

The benefits and potential of the Internet are everywhere I look. Not only in the way I work and communicate, but also in the way I shop, and even interact with friends and colleagues. But it is not just the potential for myself that I see — it is for others, too. Whether I drive down Parramatta Road, past the ubiquitous car yards, or get out of the rat race and head for the bush — where the need to get from one town to another has left smaller towns and businesses dusty and derelict — I see traditional business models shifting. While the benefits may differ for everyone, there are definite advantages to a move online, no matter what your line of business, no matter its size or location.

The potential of the Internet and its opportunities is something everyone should at least explore. But there is also plenty of potential to stuff up, especially if the Internet is not your forte. Making the move online requires more than some shots of your products, pricing and an online order form — which some businesses believe is all there is to e-commerce.

When I think about the old style, bricks and mortar shopfront or business, I realise that many of the same rules of those businesses apply online. Businesses that take the time to plan their online strategies, and listen to their customers, will ultimately succeed, where other "me too"-style start-ups fail.

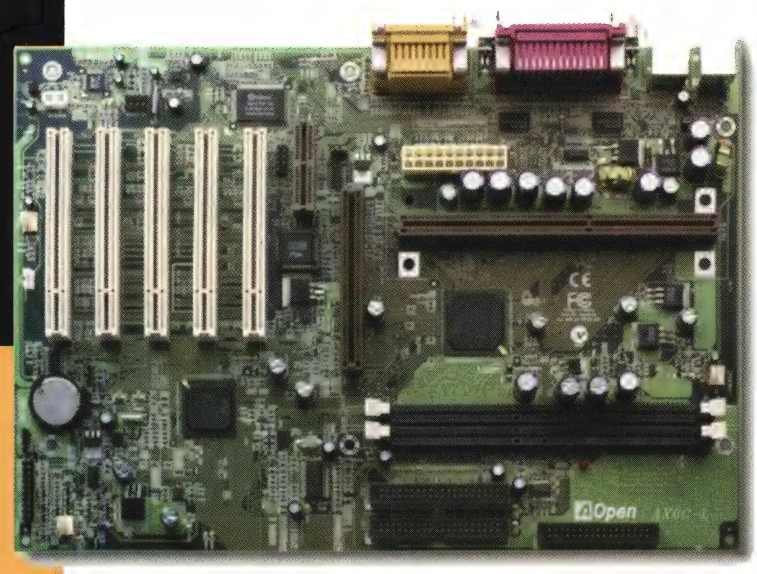
In Australia, the sector with the most to gain from the move online is small to medium businesses. With many larger enterprises and government organisations investing heavily in Internet technologies for their business, many smaller businesses feel lost in the hype, and miss the potential of the Internet to level the playing field. No longer does the size of your business, nor its geographical location, have to factor in its success — with the Internet, you can play with the big boys! But this is also a sector that is already stretched, both financially and in terms of time invested in the business. So, while most small to medium businesses want to make the move online — either now or in the future — most believe that investing time, resources and the money and infrastructure for an online expansion may push them to the brink.

Or will it? This month, PC World launches its e-commerce editorial initiative, eComWorld, as a special section focusing on global networked business. Spanning the coming months, eComWorld will look at the things businesses really want (and need) to know — making money online, how to save time and money and, importantly, how to get online without blowing the bottom line. Each edition of eComWorld is broken into ordered, easy-to-reference stages, which will assist businesses through their online progression. The stages will contain a mixture of planning, background information and steps of action, from determining if the time is right to make the move online, to building an information site, and all the steps in between. And best of all, this independent information source will be all in one place — at your fingertips! ■

If you think e-commerce starts and ends with some snaps of your inventory, an online order form and an e-mail address, then you may need to rethink your move into the global economy — because it will probably fail.

Amanda Conroy,
Editor

The Die Hard Motherboard



It is going to take one mutha-of-a virus to get the better of the Servex AOpen AX64Pro Motherboard.

With a built-in Die-Hard BIOS, the AX64Pro has complete, virtually fail-safe, virus protection.

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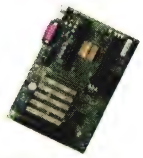
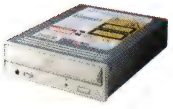

Mainboards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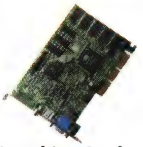
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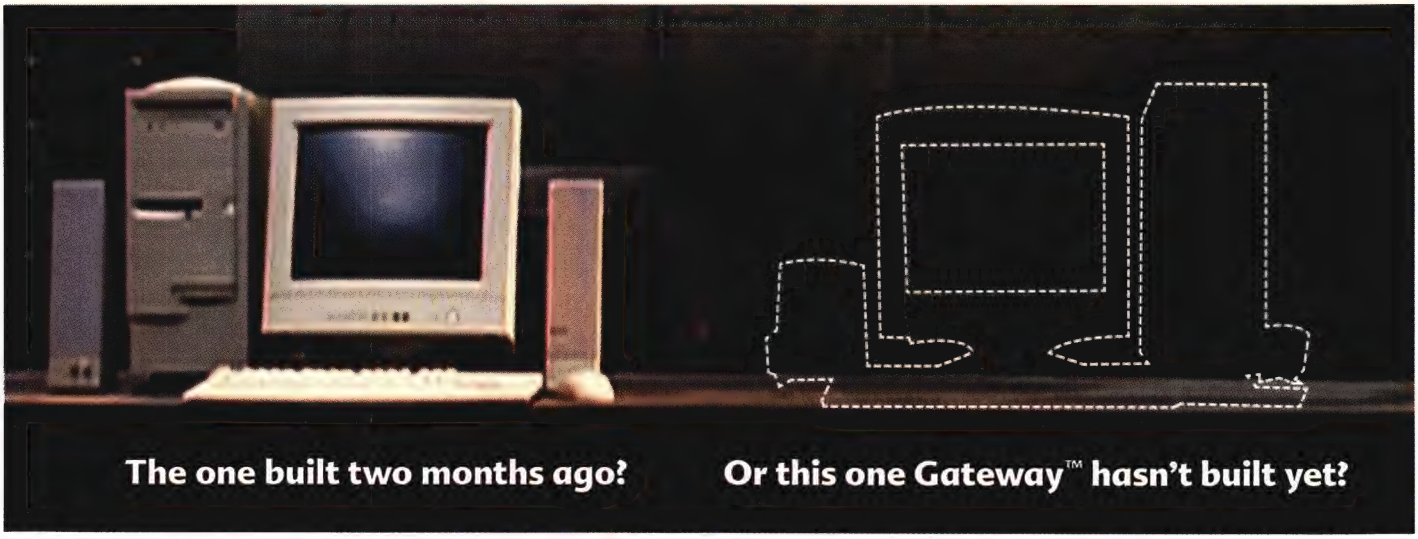

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Judge rules: Microsoft broke law

BY NANCY WEIL, ALEXANDRA KRASNE, CAMERON CROUCH, TOM MAINELLI, AND STAFF WRITERS

US District Court Judge Thomas Penfield Jackson has ruled in his conclusions of law that Microsoft violated federal antitrust laws. The judge found earlier, in findings of fact released last November, that Microsoft is a monopoly. This subsequent ruling occurs after mediation talks for a settlement broke down. Jackson wrote, in the 42-page Conclusions of Law, that Microsoft violated both Chapters 1 and 2 of the Sherman Act, which is the US antitrust law under which Microsoft was charged.

"The court concludes that Microsoft maintained its monopoly power by anticompetitive means and attempted to monopolise the Web browser market," Jackson wrote.

However, Jackson found that Microsoft's marketing tactics, including preferential deals for some business partners, were not illegal. He wrote, "the facts found do not support the conclusion, however, that the effect of Microsoft's marketing arrangements with other companies constituted unlawful exclusive dealing under criteria established by leading decisions under Section 1."

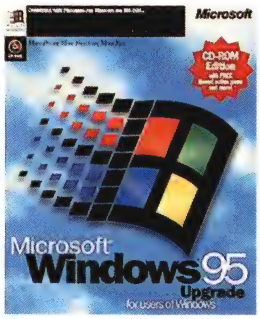
The US Justice Department and Attorneys General of 19 states have pursued legal action against Microsoft for nearly two years.

Microsoft vows appeal

Microsoft officials have declared the company will appeal the ruling. "Today's ruling was not unexpected, given the District Court's previous rulings," says a Microsoft statement.

"Microsoft will request an expedited review by the US Court of Appeals, following a remedies phase and final decree. The appeal will stress a 1998 US Court of Appeals decision that affirmed Microsoft's right to support the Internet in the Windows operating system."

Although the judge ruled that Microsoft's marketing deals with other vendors were not unlawful, his verdict endorses the US Government's position on other key points of the case.



It paints a damning picture of anticompetitive behaviour by a company bent on controlling the Internet browser market and maintaining its operating systems monopoly.

Microsoft behaved as a "profit-maximising firm" in its approach to stomping out competition in middleware, specifically when it came to dealing with Netscape Navigator and Sun Microsystems's Java technology.

"Simply put, middleware threatened to demolish Microsoft's coveted monopoly power. Alerted to the threat, Microsoft strove over a period of approximately four years to prevent middleware technologies from fostering the development of enough full-featured, cross-platform applications to erode the applications barrier," Jackson writes.

Jackson's companion ruling must have come as somewhat better news to the company: Microsoft's marketing arrangements with partners, particularly systems vendors, were found not to be illegal under antitrust law. ■

news briefs

Worm makes emergency calls

If your system is on the Net and sharing files, a new virus-like program of a type technically known as a "worm" may be able to download itself into your computer — without any action on your part. This differs from the more common viruses we're used to, which usually require the user to perform some action, such as running a program, before they can infect.

BAT.Chode.Worm is a new wrinkle in computer sabotage that has two nasty tricks up its sleeve. First, on every fifth infection, it uses your computer modem to dial 911 and then hangs up. This is a big problem for American users, because over there it's the emergency police number. In Australia, dialling 911 has no effect.

In addition, on the 19th of the month, BAT.Chode.Worm erases all files in your PC's \Windows directories, rendering your PC inoperative. (The file-erasure payload doesn't affect Windows NT or Windows 2000 systems, unless you've renamed the default Windows installation directory to \Windows during installation.)

Unlike a virus, BAT.Chode.Worm doesn't need you to download an infected file or open an infected e-mail attachment. It randomly searches IP addresses used by popular Internet service providers, and looks for "open" PCs that have file sharing enabled. When it finds one, it loads files that are run the next time you start your PC, infecting your PC with the 911 and directory erasure payloads.

Worse, your PC becomes part of the problem. Whenever you're connected to the Internet, BAT.Chode.Worm uses your connection to look for other open PCs and infects them, too. Experts who have analysed the worm say the users most likely to be infected are those who have accounts with American providers.

Aussies storm Comdex Asia 2000

BY DAVID HELLABY

A group of Australian companies have signed up millions of dollars worth of deals in a concerted attack on the Asian market.

The 18 companies launched a two-pronged attack on Singapore recently and came away with a wide range of agreements and deals, and the satisfaction of knowing that Australian IT companies could successfully compete internationally. The companies, from all over Australia, travelled to Singapore in two main groups — one arranged by the Australian Interactive Industry Association, and the other headed to Comdex Asia 2000.

One of the most successful was Melbourne-based Infosentials, run by former Nine Network reporter Michael Schildberger. Infosentials, which listed on the Australian Stock Exchanges last year, specialises in online training and help systems.

It landed several deals in Singapore and Malaysia including a hosting and revenue sharing agreement with Singapore's largest Internet Service Provider, 1-Net; a contract to provide the company's distance learning solution to the International Video Conferencing Centre; an agreement with training group 1 to 80 to license Infosentials' Australian Computer Driving Licence computer skills competency test; and an announcement that the Malaysian Institute of Accountants had agreed to trial the company's electronic resource management solution.

A buoyant chief operating officer Gary Gosling announced that the company's Singapore raid had been so successful it would open an office on the island. He said the mission had opened opportunities in Singapore, Malaysia and Indonesia, including a possible joint venture with Singapore Computer Systems.

Perhaps the greatest success story to come out of Comdex was that of tiny Brisbane start-up Ephox. The company, started by 22-year-old IT entrepreneur Andrews Roberts, has developed a browser plug-in called EditLive! that allows anybody to update Web sites without the need for a specialist Web editor or any knowledge of HTML.

At Ephox's small stand, they chalked up deals potentially worth several million dollars, including the sale of 10,000 licences to a Singapore University. They also began negotiations with a leading Asian ISP with 7 million subscribers.

Earlier, Ephox had sold 50,000 licences of its specialist educational version to Griffith University in Queensland.

The Tasmanian Government took four local companies to Comdex Asia and came away with some profitable business and at least one good anecdote. Singapore's Minister for Communications and Information, Yeo Cheow Tong, stopped by the Tasmanian stand and showed interest in visualisation software developed by Autech Research that allows paint manufacturers to offer their clients digital paint palettes to see what a room will look like when painted in a particular colour.

The Minister of Defence would be particularly interested in the program, he said. Hopeful that there could be a Defence Department contract in the offing, Autech staff put on their best presentation, only to find the minister was renovating his home and was interested in the program for himself.

However, Autech is hopeful the encounter may lead to bigger things in the future. ■

news briefs

Big Brother can't sack you for union e-mail

Ansett is likely to be fined an undisclosed sum for sacking an employee who sent a union-related message using the company's e-mail system.

According to Martin Foley, president of the Victorian branch of the Australian Services Union (ASU), the airline company dismissed union delegate Maria Gencarelli for forwarding an angrily worded e-mail around her department.

The subject of the e-mail was enterprise bargaining, he said.

Foley said the Federal Court in Melbourne had rejected Ansett's claims that Gencarelli breached company e-mail policy, which prohibits staff from communicating any matters unrelated to work within or out of the company via e-mail.

"She was doing her job as a union delegate," Foley said.

In fact, the judge found that "Ansett acted illegally under the provisions of the workplace relations act dealing with freedom of association". He added, however, that Ansett did not break any laws by inspecting employee e-mail because the company legally owned all text on its e-mail network.

Foley said most companies had clearly defined e-mail policies in place. Typically, company policy allowed "a certain amount of chitter-chatter" via e-mail, although union activity qualified as part of a company's core business. An Ansett spokesperson said the airline company accepted the court's decision.

The ASU will submit a legally justified suggestion to the Federal Court regarding a suitable fine for Ansett. Foley said the union had not yet finalised the amount.

Discussions on whether or not Gencarelli will return to work at Ansett have not yet been finalised.

Storm brews over new memory

BY ALDIS OZOLS

For some time now, Intel has been promoting a new memory standard for PCs that use its processors — RDRAM, a high speed product designed by the Rambus corporation. According to Intel, its advantages include higher bandwidth (the amount of information that can be transferred per second) and lower latency (the time it takes for information transfers to start).

Unlike the current open standard, SDRAM, the new memory is proprietary, and anyone who wants to produce it has to pay a royalty fee to Rambus. This new memory type is also very expensive: 128MB can cost as much as $2000, while a similar amount of SDRAM can be had for around $250. Perhaps more worrying are independent tests which suggest that RDRAM doesn't perform much beter than SDRAM — in fact, it may even be worse.

The rot set in when a comparison test by Tom's Hardware Guide (**www.tomshardware.com**) found that a motherboard using 133MHz SDRAM and Intel's supposedly obsolete BX chip set could outperform the fastest RDRAM on Intel's latest chip set. This report also cited technical reasons why it was believed that RDRAM wouldn't be getting much cheaper or faster in the future.

As yet there has been no convincing refutation of these claims, and further testing by XBT Hardware seems to support them.

Rambus is now suing memory manufacturer Hitachi in an effort to stop it selling SDRAM products. Hitachi has counter-sued, claiming the Rambus patents are invalid. ■

Utility combats spyware

BY CHARLES BERMANT

Are you warming up to advertising-supported software, which can mean getting a full-featured program essentially for free? The "catch" is that ads are part of the interface, and they're watching you while you're watching them, privacy advocates warn.

To be sure the ads don't transmit more than marketing data, software entrepreneur Steve Gibson has developed a free utility, OptOut, that scours disks for this "spyware" and uninstalls it from your system.

"Despite what the manufacturers may say, there is no chance to opt out of this background operation when you install some of these programs," Gibson says. "I am providing that choice."

Using OptOut is almost too simple. Just download it from **grc.com/optout.htm and** run it; the whole process takes less than 30 seconds. Gibson said 173,000 users have downloaded OptOut since it went online in mid-March.

"There is a good side and a bad side to connectivity," Gibson said. "You need to be aware that when you are connected to the Internet there is a much wider 'back channel' that connects your computer to everything else. And software can communicate where it wants to, without giving you a choice." ■

news briefs

Does IE 5.5 ditch standards?

Microsoft is under fire from the Web Standards Project, which claims the software giant has done an about-face on a pledge to support Web standards in its upcoming version of Internet Explorer.

The Web Standards Project, a two-year-old coalition of developers and users that promotes the use of standards in Web-page development, issued a sharply worded statement accusing Microsoft of abandoning its promise to abide by World Wide Web Consortium (W3C) standards in Internet Explorer 5.5, due to ship in a few months.

The release said the Web Standards Project is "incensed by Microsoft's arrogance" over a standards issue that is crucial to Web developers. The dominant position of Microsoft's Windows operating system, into which IE has been integrated, will make it nearly impossible for developers to create documents that adhere to the W3C standards.

Web Standards Project group leader Jeffrey Zeldman says he was surprised to find last week through a Microsoft press release that IE 5.5 would not support W3C standards that Microsoft and other computer industry leaders, including Microsoft's rival in the browser market, Netscape Communications, agreed to support a few years ago. Most notably, Zeldman cites the planned lack of support for portions of cascading style sheets, a standard established in 1996, and Document Object Model 1 Core.

After consulting with other members of the Web Standards Project's steering committee, Zeldman says a decision was made to criticise Microsoft in a press release.

"We're hoping that if we make enough noise, they may

Continued page 20

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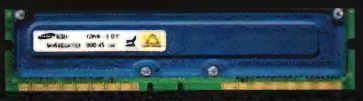

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Digital spies are watching you

BY BILL WALLACE

According to intelligence experts in Australia, the United States and Europe, a massive electronic intercept program called Project Echelon scans all Internet traffic, cell phone conversations, faxes, and long-distance telephone calls — virtually every type of electronic communication — looking for evidence of terrorist activity, military threats, and transnational crime.

Some believe it may also be used to gather commercial intelligence. The e-spying is being conducted by the secretive US National Security Agency and its counterparts in Australia, Canada, New Zealand and the United Kingdom.

"They are looking for thugs and drugs," says John Pike, expert on security and intelligence issues for the Federation of American Scientists.

That pursuit may be worthwhile in theory, but most of what the spooks are scanning comes from you and me, not from terrorists, criminals, or other menaces to society.

How the spies work

Echelon uses a filtering process to flag messages with keywords such as bomb, gun and militia. It remains unclear whether the system can differentiate between messages sent by criminals and those sent by law-abiding citizens.

For example, a person in Melbourne might innocently use two or more of the keywords in an e-mail to a friend in Japan while describing a Tom Clancy novel, or while discussing the latest James Bond movie, or even a news report about a recent terrorist act.

What happens when Echelon picks up such a message? No one knows.

If you're a typical user, your chances of coming to the attention of a live person at a national security agency — much less of being placed under more thorough surveillance as part of an investigation — are tiny. Nevertheless, the US's NSA has cast a very wide net to catch just a few suspicious goldfish. And the agency is invading your privacy to do it.

Project Echelon's equipment can process 1 million message inputs every 30 minutes, according to a series of reports commissioned by the Scientific and Technological Options Assessment program, a research wing of the European Parliament. The STOA study finds that the system filters intercepted material so minutely that only 10 inputs out of 1 million are passed along for detailed analysis — which is likely a second level of software filtering. Even fewer messages reach live analysts.

The system also reportedly uses voiceprint technology to search telephone communications for targeted speakers.

We know that our employers can monitor our e-mail. And no one condones terrorism or crime (except terrorists and criminals). But aren't we still entitled to some level of privacy? Echelon leaves us with few alternatives.

Pike says encrypting e-mail may offer some protection — as long as you aren't under suspicion in the first place.

For now, watch what you say, and where you send it. ■

news briefs

From page 18

reconsider," Zeldman says. "All they have to do is implement the standards."

Zeldman says Microsoft's decision was "very divisive" for the future of the Web. Developers who are compelled to write code for IE 5.5 will be leaving Linux, Macintosh, Netscape and Unix users out in the cold, while developers whose code complies with W3C standards will isolate Windows users. Microsoft declined to comment on the Web Standards Project's statements.

Credit card hacks — who's to blame?

Hackers have downloaded thousands of credit card numbers from e-commerce sites using Microsoft's Internet software, but local execs say end users are just not using the gear properly.

Recently, US wireless phone seller Promobility had between 50,000 and 70,000 credit-card numbers downloaded from its Microsoft Internet Information Server (IIS)-driven Web sites.

The hacker, who called himself Curador, posted credit card numbers from the Web sites of Promobility — and several other e-commerce sites using IIS technology — over the Internet.

Marketing manager for the software giant's local online group, Harvey Sanchez, said that if e-commerce companies installed the IIS software correctly, the product would not have security holes.

"People confuse a product's features with how well they know how to use it," he said. "All the features are there for you to have high encryption, high security and algorithms that will be very difficult for anybody to hack into." He agreed that a company running on IIS software without any of the provided security add-ons would remain vulnerable for "people to do anything they want".

Continued page 22

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In the wake of the recent market meltdown IDC analyst Graham Penn said:
"Long term (market) players would continue to invest in proven, viable companies, but the market would spit out the used car salesman who expected to become rich overnight."

GST software wars

BY LUISA BUSTOS

A war is brewing among accounting software providers over which can provide the most compliant GST solution.

Fresh from an Australian Tax Office-led Tax and Technology Road Show, local provider Sybiz is claiming that its product, Vision, beats other providers to "present a comprehensive GST-compliant software package," Peter Lucas, Sybiz's managing director, said.

"We believe that zero per cent of companies are GST ready because as far as we know we are the first to do the whole job — none of the other (vendors) have got the whole lot."

Sybiz has spent the last three months developing Vision, which automatically completes all 51 fields in the Business Activity Statement (BAS) and electronically sends the form to the Tax Office, said Lucas.

"[At the ATO Tax and Technology Road Show] we expected to see our competitors with similar software, but they didn't have it. Some only had partial software . . . they extend to collecting information, but also rely on users doing things manually," Lucas said. No Australian businesses have successfully implemented GST-compliant software that completely handles the tax change, he claimed.

However, Rob Evers, general manager of MYOB, is more confident businesses are prepared for the 1 July deadline. "I don't know exactly how many [businesses are ready] . . . but a lot of our [180,000] customers would already be getting organised."

While Evers admitted MYOB's GST-compliant software did not automatically complete the BAS, he said MYOB's solutions meet the required criteria set by the provider in accordance with the ATO's Software Consulting Committee.

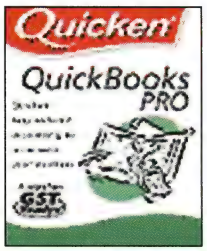
"We believe that to be GST compliant, software needs to meet a basic set of criteria . . . and MYOB meets those. Our products enable an SME business to collate, collect and report on all information needed to complete the BAS," Evers said.

Criteria established by MYOB include the provision of inclusive and exclusive pricing, the issue of tax invoices and adjustment notes, tax type compliance and GST liability reporting, Evers said.

Paul Marshall, Quicken's group product manager, said Quicken's GST compliant software, Quickbooks V.7, will be fully compliant with the Government's GST plans by 30 June. Released on 1 March, the solution is currently only partially compliant but includes updates incorporating all the latest GST functionality, Marshall said.

According to Marshall, Quicken's product includes tax inputs and outputs including the Luxury Car Tax, and in May will have full BAS reporting and automatic form submission capabilities.

"What we're saying is that our product today includes the sales tax code and the GST code. [Additionally] we will provide updates . . . so by the time the GST hits, we will be the most GST compliant," Marshall said. ■



news briefs

From page 20

According to Sanchez, Microsoft 18 months ago released an SSL encryption upgrade patch for customers using IIS in conjunction with Windows NT 4. The patch was made available via Microsoft's Web site.

However, Microsoft Australia was unable to reveal how many local IIS users had downloaded the patch.

Sanchez said Australian IIS users include Commonwealth Securities, D-Store, ToySpot.com.au, Wishlist.com.au, and Chaos music. He maintains that no Australian Web site using IIS has suffered from a hack attack.

Zaplets enliven your e-mail

E-mail may never be the same if FireDrop succeeds at delivering a service that pipes dynamic messages into your e-mail inbox.

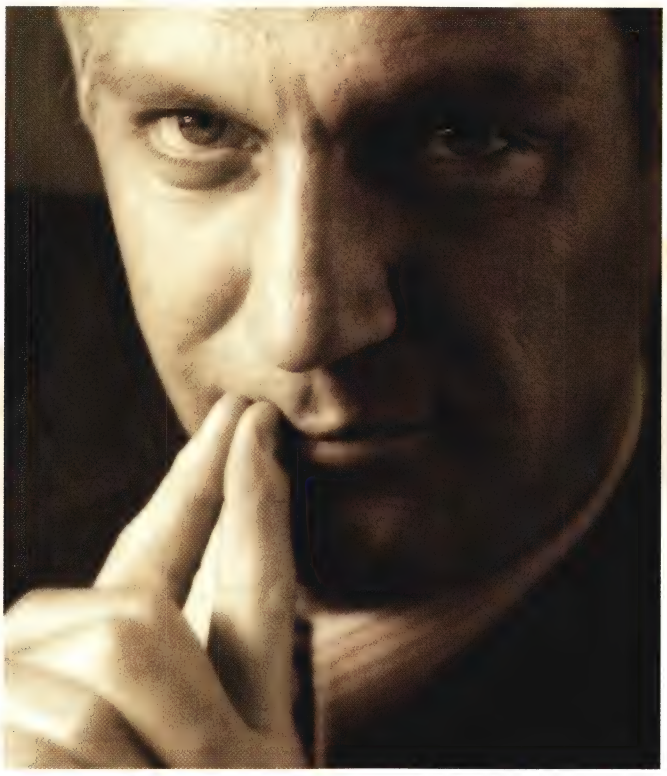
Using FireDrop's pre-packaged mini-applications called Zaplets, you can turn static e-mail messages into active documents that are updated remotely and shared among multiple recipients. Now, you can share schedules, contacts and discussions through a single e-mail message using a free test version of the FireDrop service.

What's more, Zaplets can automatically update each message with new information and other recipients' responses.

Here's how it works: e-mail bearing a Zaplet arrives in your inbox, and is dynamically linked to a FireDrop server. FireDrop can then update the delivered e-mail message remotely with, for example, current news headlines, weather forecasts, and stock information.

"Right now, when you receive e-mail it is D.O.A.," says Julie Welch, a FireDrop representative.

"Even HTML-formatted looks better, but it is still dead." ■



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cheating

Catch me if you can

BY SCOTT MENDHAM

Cheating is always a risky short-cut for any student. Most have probably tried it at some stage, and many have been caught. With the Internet being used to illegally distribute software or music, it is no real surprise that it can also be a haven for students wanting to cheat. But it's not all one way — the same resources are being used by teachers to help track down those students trying to gain an unfair advantage.

Before computers seriously entered schools and universities, the most common examples of cheating were to reproduce answers from undisclosed references (copying text books) or to ask a friend or fellow student for a copy of their answer. When teaching at the University of NSW, it was relatively easy for me or any lecturer to detect both of these techniques. After reading 100 different responses to the same question, suspicious answers reveal themselves very quickly.

Some students had more resources at their disposal and were typically residents of the campus colleges (unlike the US term, college refers to accommodation or dorms where the students live). Longer-term residents of these colleges would collect copies of the best answers and pass them on to struggling students. Answers from these libraries were harder to spot, as they could be copied from various sources. However, a slight change to the question would quickly flush out the honest answers from those which had been "outsourced".

That was a decade ago, a time when using a computer to answer an assignment would have been met with wonder, not discipline. Now, with the anonymous resources of the Internet and computer-savvy students, the issue of cheating has become far more complex. Genuine online resources or CD-ROMs allow students to copy text in a flash. While frowned upon, this still requires some searching and assessment skills from the student. The next level up gets far more serious and falls into two basic categories: sites offering ready-made answers to essay topics, and those which will accept payment to prepare an essay on a given subject. Many of these sites are free, while others charge for their services.

Schoolsucks (**www.schoolsucks.com**) boasts that its library of 4500 ready-made essays and term papers is free. Given that each page has five banner ads pointing to paid essay services, and the linking codes imply that there is an affiliate/business relationship between the sites, schoolsucks is really just another site trying to squeeze money from gullible students. Another free service is the Evil House of Cheat (**www.cheathouse.com/uk**) which boasts a larger library.

Research Papers Online (**www.ezwrite.com**) looks more like an e-commerce site, with its shopping cart icons and marketing hype: "We have the lowest prices, highest quality and we offer instant delivery to your browser." All it needs is a slogan such as "the ideal gift for your child". Prices start from about $A10 page, with cheaper rates for a copy of existing material and up to $A13 or more for specialised topics (plus tax and shipping!).

Interestingly, few sites are dedicated to maths, the sciences or

online news

Online government — Act One

While the National Party continued to raise concerns over the quality and availability of communications technology in the bush, the Federal Government has said it is a step closer to putting most of its services online.

As part of its commitment to having a majority of government services in electronic format by 2001, the Government has introduced the Electronic Transactions Act (1999) and Electronic Transactions Regulations (2000). The Act and Regulations are considered to be key components of the Government's legal framework for the online environment as set out in its Strategic Framework for the Information Economy.

The Act provides a "light-handed" legal framework to support and encourage business and consumer confidence in the use of electronic commerce, the Federal Attorney General, Daryl Williams, said. The regulations will identify a wide range of Commonwealth legislation to which the Act would apply, he said.

The Act will allow Australians to use the Internet to submit "legally sound" electronic documents to a range of government departments and agencies. The new rules will also allow users to communicate with the Government electronically, Williams said.

Among other changes, citizens will be able to lodge legal assistance applications for family law matters electronically, and to apply for access to the Freedom of Information Act online, Williams said.

After 1 July 2001 the Act will apply to all Commonwealth laws except those that are specifically excluded from its application. The

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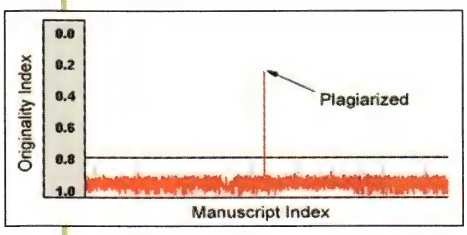
engineering. This service would be far more difficult to provide as it will require a greater understanding of the subject. Numbers can be easily changed from year to year while retaining the same principals and equations. Also, the service would be harder to sell — there are no word counts, and formatting complex mathematical equations on a PC can be time-consuming.

Technically, there is nothing illegal about paying a company or individual to prepare a research paper or essay; however, submitting the paper or any part of its contents as the student's own work is considered cheating. Many of the papers on the cheat sites had poor bibliographies, making it harder to check the facts of the paper. The sites also have disclaimers for the naïve, such as this one from **www.research-assistance.com**: "While there are many positive and valuable ways in which Research Assistance reports can be used, they should NEVER be turned in as your own work. We do not want you to violate policies concerning academic dishonesty."



So, if you are a 16-year-old student who pays A$100 for a report, aren't you going to be a little tempted to submit it as your own work? Also, the terminology is evasive. By avoiding the word "cheat", they are downplaying the risk, making it more acceptable. It is like saying, "I didn't cheat on my wife — I didn't follow the marital dishonesty policy."

A quick look at the samples of the work on the cheat sites can make you wonder why a student would pay for these services when they could produce the same garbage for free. It will also be fairly obvious to most teachers that the work was not that of the student. However, using a number of the many sites on the Internet offering these services, and employing a little creative pasting, would make it easier to avoid detection.

Teachers have the dilemma of trying to standardise assignments across all classes in order to equally assess students, but this will increase the likelihood of cheating. During my time at the University of NSW, many lecturers would not return larger assignments, to avoid cheating. However, this had limited success, as it encouraged students to photocopy the papers before submitting them in case they were lost.

To fight back against cheating in the computer age, two notable resources have appeared for teachers. The Essay Verification Engine (EVE) is a shareware program that claims to capture 80-90 per cent of plagiarised work (see this month's CD). These results are based on US answers, so they may vary in Australia. Another resource is the online site for the Glatt Plagiarism Program (**www.plagiarism.org**). The site accepts suspicious essays and assignments in text format and will automatically analyse the document for evidence of plagiarism (see picture).

While the quantity of online cheating resources is stacked in favour of the student, teachers have the benefit of experience to assess suspicious papers. The Internet is extending the reach, rather than inventing a new evil: some sites claim to have been providing essays as far back as the 1960s and 1970s. As long as there have been students, there have been cheats — a situation that is not likely to change. ■

online news

legislation forms the basis of a uniform national legislative scheme for the future.

Online government — can they do it?

The Federal Government has pledged it will pay "all suppliers electronically by the end of 2000", but industry execs are divided over whether the Government can do it.

In releasing the Government's e-procurement strategy, Senator Ian Campbell, Parliamentary Secretary to the Minister for Communications, IT and the Arts, outlined a government goal of providing standard electronic procurement systems through which all Commonwealth agencies could transact by the end of 2000.

However, Nic Pollock, managing director for e-procurement software developer Viewlocity, considered the e-procurement strategy to be "tremendously ambitious". He said it was doubtful the Government could integrate its array of existing Internet technologies into a unified infrastructure by the end of the year.

Meanwhile, www.consult's Ian Webster praised the "proactivity" of the Federal initiative. "It's always good to be ambitious." He said initiatives such as this were crucial to the formation of a local, functional digital economy. The influence the e-procurement strategy will have on Australian businesses will effectively "market-make" an Australian digital economy.

The Government also announced that digital authentication company eSign Australia will provide government agencies with the identification and authentication technology required to support government online transactions. ■

first looks

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MetaCreations Carrara

GRAPHICS SOFTWARE

MetaCreations Carrara — in brief
Price: $799
Distributor: Scholastic New Media
Phone: (02) 4328 3555
URL: www.metacreations.com; www.scholastic.com.au

Named after Michelangelo's favourite marble quarry, MetaCreations' $799 Carrara is billed as the "complete" 3D modelling tool for artists and designers. Inspired by its siblings Ray Dream and Infini-D, Carrara collects more than 600 impressive features inside a stylish interface. It will gratify picky pros and hobbyists, but may daunt novices.

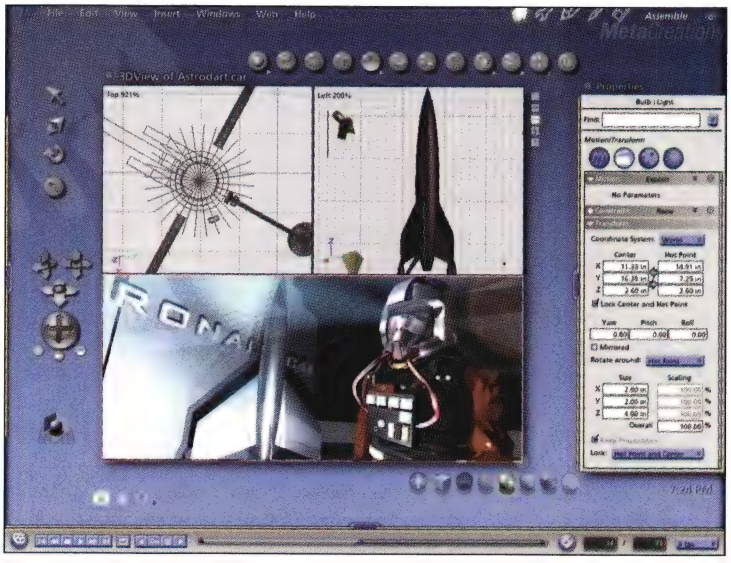
Carrara's interface resembles that of MetaCreations' Bryce landscape creation software: icons glow when activated, navigation knobs allow fluid manoeuvres through 3D scenes, and preview screens let you accelerate work on special effects. Trays slide out from the sides of the screen to reveal animation controls, property settings, or libraries of pre-set objects and effects.

Different stages of model production occur in five separate rooms (Assemble, Model, Storyboard, Texture and Render), each equipped with suitable tools and effects. The Model room, for example, makes available six model-making modes for shaping organic forms, creating models from math formulas, turning TrueType fonts into 3D logos, or sculpting fantasy landscapes. The only thing missing is a Drop Object command to help ensure that your models rest on the ground.

Carrara mimics real-world nuances beautifully, distorting a rubber ball as it bounces off a wall or straightening an arm when you tug on a character's hand. Optical and atmospheric effects (such as blurring fast-moving objects or simulating dusty beams of light) are equally cool. And unlike most 3D apps, Carrara renders these effects lickety-split.

Carrara imports and exports images and models in most popular 2D and 3D formats, including JPEG, GIF, AVI, QuickTime, VRML (1 and 2), and MetaCreations' MetaStream format. For the tools it delivers, Carrara is a bargain. ■

– John Goddard



Flow or flounder: Carrara's five-room interface provides many spectacular 3D modelling effects, if you take the time to learn them.

Leo BabyNet PC

LEGACY-FREE PC

Leo BabyNet PC — in brief
Price: $1699
Distributor: Retravision (selected stores)
Phone: (02) 9745 1133
URL: www.retravision.com.au

If you thought PC's couldn't get any smaller or change radically in appearance — think again! The Leo BabyNet PC made a stay in our Test Centre this month amid comments of "oh, that's pretty" and "ooh, what's that?" from curious co-workers. Its appearance is nowhere near that of the traditional beige box, and neither is its internal design.

The Leo BabyNet PC attempts to make using a PC a straightforward task by eliminating legacy devices such as serial ports, parallel ports, PCI slots and ISA slots. For connectivity, five USB ports are at your disposal, two located on the front panel of the system for easy access. The BabyNet also has a standard VGA port on its rear end as well as built-in modem and Ethernet connections. A floppy drive ships with the system, which is not built-in and uses a USB connection.

The BabyNet's oval shape is unique, to say the least, and its colour scheme follows closely on the trails left by the blazing iMac — it is available in five flavours (or colours) and implements translucency. And the translucency is not limited to the main unit, as all peripherals, including the monitor, sport see-through designs. The monitor, however, has a familiar beige bezel, which does seem oddly out of place with the rest of the system. The BabyNet is not an all-in-one unit, and the monitor and speakers enjoy freedom from the main unit. This is not a bad idea, as it gives you the flexibility of perhaps attaching a larger monitor or more powerful speakers in the future. By getting rid of all the legacy support, the size of the unit has been reduced, and, barring notebooks, how many PCs can you lift with only one hand? Well, the BabyNet is one of them. The power supply has also moved out of the PC enclosure, with electricity provided via an external 60Watt transformer.

It is a non-user serviceable unit; with the exception of the hard drive and the memory, nothing can be added or upgraded. The CD-ROM drive is located on the front panel of the system and the lid flips up to allow you to insert a disk. This design does leave the sensitive laser pick-up system exposed to the elements or accidental contact when it is open.

To access the internal components, you need to slide the chassis of the system out of its case from the front. This reveals only one memory slot, which is occupied by a 32MB stick, and gives the system a maximum memory capacity of 128MB.

The 6.4GB hard drive can be removed quite easily to add more gigabytes. The legacy free motherboard is based on AMD's Easy Now! platform and houses a 450MHz AMD K6-2 processor in its Socket 7 slot.

One of the more exciting features of the Leo BabyNet is the implementation of a home phone line networking device, which allows you to network your computers by simply plugging them into your existing phone sockets.

For our benchmarking tests we used PC WorldBench 98 to gauge 2D-application performance and 3DMark 99 Max to test 3D performance. In PC WorldBench 98 a score of 139 was achieved, roughly comparable to a 300MHz Celeron computer, while in 3DMark 99 Max the system was a no-show, scoring a mere 326 points. It's a great little unit for getting on the Internet or for using a few office applications. During the course of the tests we did notice that the supplied 15in Leo monitor suffered from terrible regulation, that is, every time a new window was opened or closed the screen would give the illusion of moving in and out. The elimination of legacy devices is designed to reduce the loading time of the system, although it still took us 120 seconds to get up and running.

One of the features that makes this PC so user-friendly is the single button on top of the unit which can be used to turn it off, without needing to navigate to a shut-down menu, although it seemed that this button only put the computer to 'sleep', rather than turning it off completely. Also adding to the user-friendliness is a start-up poster, which illustrates and explains how to set up the BabyNet PC quickly. Unfortunately, half of this guide was printed in a language other than English, but because the only peripherals you need to plug in are all USB, there is little to no chance of making a blunder. Simply plug the keyboard into one of the front-loading USB ports, attach the mouse to the keyboard, plug in the floppy, attach the monitor and speakers, hook up the modem cable and give it some power. This PC is meant to be as easy to set up and use as any other home appliance.

The Leo BabyNet PC represents a new era of legacy-free computing and is aimed at helping newbies join the PC revolution. For $1699 you get a computer with all the basic requirements, but the one-year warranty is a little skimpy. ■

– Elias Plastiras

Epson Stylus Photo 870 and Sony UP-DP10

PHOTO PRINTERS

in brief

Sony UP-DP10
Price: $680 (ex tax)
Phone: 1800 017 669; (02) 9331 1355
URL: www.sony.com.au

Epson Stylus Photo 870
Price: $799 (incl. tax)
Phone: (02) 9903 9000
URL: www.epson.com.au

It's only logical: when you print digital photos, you want results that look, feel and last as if they came from a photo lab. Two new photo printers — Epson's $799 Stylus Photo 870 and Sony's $680 (ex tax) UP-DP10 — come as close as any that I've seen to achieving this goal. I tested shipping units equipped with pre-production drivers.

Stand-up Sony: the svelte UP-DP10 (top) prints photos only. The Stylus Photo 870 (below) can print on photo or plain paper.

At first glance, the Stylus Photo 870 behaves like a typical inkjet. It prints black text and colour graphics on plain paper, and has both USB and parallel ports. This device really struts its stuff when you print your photos on Epson's special paper. The resulting images are gorgeous, with accurate, subtle colours and a continuous-tone look belying their inkjet origins. Although most inkjet photos are notoriously prone to fading, Epson says prints on its new paper will last as long as traditional silver halide photos.

In my tests using a USB connection, the Stylus Photo 870 printed an 8x10in photo in about four minutes; 4x6in snapshots took around 90 seconds apiece. A 4x6in print costs about $1.70 for special paper and ink. My one big gripe: Epson's roll paper, which you can use to print edge-to-edge snapshots, is cumbersome to handle. You have to cut strips of photos apart manually. And as with previous Epson photo printers, black text prints on plain paper a tad fuzzily. Even so, this versatile printer is a find for serious digital shutterbugs. (A wide-format version, the $1099 Stylus Photo 1270, prints at sizes up to 13x44in.)

Sony's skinny printer

One look tells you that Sony's UP-DP10 is a highly unusual photo printer: its skinny, upright shape fits easily in tight quarters. The compact design is crucial, given that this unit won't be your only printer: it produces only photos, none larger than 4x6in. A 2x3in or 3x4in print costs about $1.20, comparable to what you would pay for film and prints at a mid-range photo finisher. Each photo took about 90 seconds to print in my tests, using a USB connection. (Both printers offer parallel port connections, too, but you'll get slower speeds if you use them.)

The Sony creates prints that most people will think you just received from the photo lab — especially since you can mimic the look and feel of a glossy, matte or textured finish. The printer uses dye sublimation, a process that many high-end colour models use to avoid the inkjet's tendency to fade.

The UP-DP10's image quality is better than fair but falls short of the Epson's. Contrast was a little off — details such as wrinkles in dark clothing disappeared — and lower-resolution pictures occasionally showed jaggy edges.

If you're comfortable investing around $700 in a printer that handles only photos, the Sony deserves consideration. It's especially worthwhile if you're satisfied with your conventional printer for documents but want better photos for little loss of desk space. But the Epson's fine print quality, greater versatility, and price give it broader appeal. ■

– Harry McCracken

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Halfbrain.com's BrainMatter and Bitlocker

CALCULATING WEB SITES

in brief

Halfbrain.com BrainMatter
Price: Free
URL: www.halfbrain.com

Bitlocker
Price: Free
URL: www.bitlocker.com

Who needs Excel? Halfbrain.com's BrainMatter isn't for macro maniacs, but this Web-based spreadsheet may be all you need.

If you travel a lot and need to use a spreadsheet or database at different work sites, you now have a choice: you can lug around a notebook containing your apps and data files — or you can travel light, find a PC with an up-to-date browser, and use the free online tools offered by Halfbrain.com and Bitlocker.

These ad-supported Web sites offer free spreadsheets and databases, respectively, to anyone with a 4.0 (or later) version of Netscape or Internet Explorer. Granted, they aren't open-ended programming environments like Microsoft Excel and Access, but they do offer functionality that would cost hundreds of dollars in a shrink-wrapped application package.

Pre-configured templates range from quickie calculators and list generators to robust business tools. For example, Halfbrain.com's BrainMatter spreadsheet contains hundreds of pre-configured worksheets in mainstream business categories — profit-and-loss statements, budgets and other financial reports; business forms (for example, purchase orders and expense reports); and human-resource tools like timesheets and employee reviews. These worksheets contain most popular (and some exotic) spreadsheet functions, packaged in an interface so similar to Excel that you can skip training time.

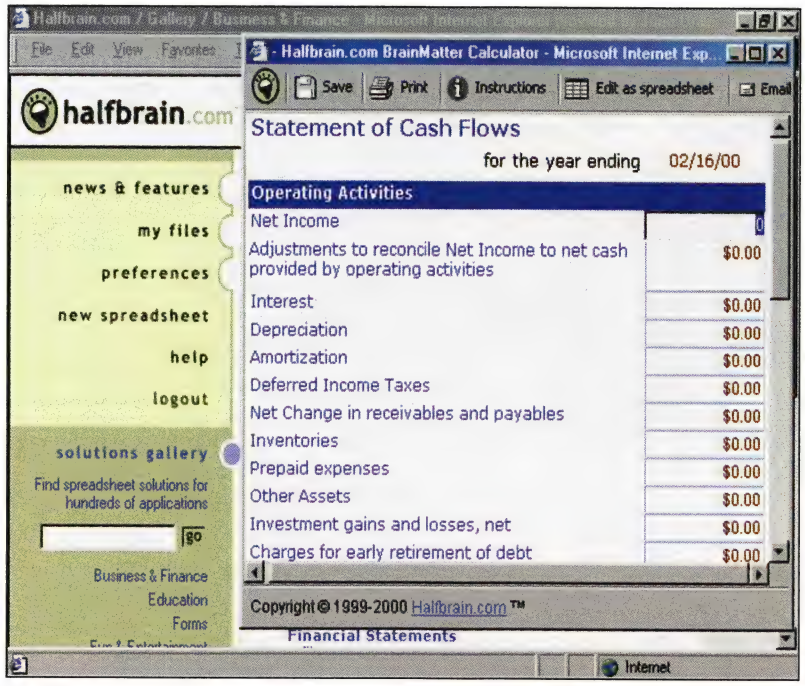
Halfbrain's single sheets (no workbooks) were chosen to satisfy the needs of spreadsheet users, not hard-core macro slingers. You can customise BrainMatter to your heart's content, or upload your own Excel 2000 data and formulae (you must save them to HTML format first). You get unlimited on-site storage, too.

Database design is a bigger challenge, and Bitlocker's inventory of pre-configured databases is less impressive than Halfbrain's spreadsheet offerings. Nonetheless, you'll find templates for business contact management, inventory and pricing data, employee evaluations, and meeting or product schedules. The site also maintains consumer-oriented address books, photo albums, recipe and gift lists, and templates for tracking music, wine, or Beanie Baby collections. Like BrainMatter's templates, those in Bitlocker are easy to customise, and you can build your own database from scratch or import data in comma- or tab-delimited format. One quibble: between the navigational bars and the banner ad, the workspace is a bit cramped.

Bitlocker sets aside 25MB of storage space for your files. An ad-free, $US100-a-year premium service gives you 100MB of storage space and priority customer support.

Even on a dial-up connection, both sites are zippy. In fact, Halfbrain.com is exceptionally fast, thanks to its use of Dynamic HTML. Both resources pledge to protect your data and promise not to hassle you with marketing pitches unless you permit it. If you're not used to performing routine business tasks online, leaving your desktop package may be unwise. But for easy access to basic spreadsheets or databases wherever you go — and insurance against software obsolescence — these free office apps are worth a try. ■

– Mike Hogan



Who needs Excel? Halfbrain.com's BrainMatter isn't for macro maniacs, but this Web-based spreadsheet may be all you need.

Dell Dimension B-1000r Special Edition

1000MHZ PENTIUM III PC

Dell Dimension B-1000r Special Edition
Price: $8518
Phone: 1800 335 502
URL: www.dell.com.au

in brief

To celebrate the milestone of processor power reaching 1000MHz, Dell has released a Special Edition version of its Dimension XPS B-1000r. Based on the Intel 1GHz processor, this system includes 256MB of PC700 RDRAM, a 4x AGP 64MB DDR GeForce graphics adapter and a 30GB hard drive. Optical media hasn't been forgotten: CD-ROM and DVD capabilities are fulfilled by a 12x Toshiba DVD drive, while a Sony CD-RW drive performs the CD writing and rewriting. Both are IDE devices.

The machine is aimed at enthusiasts and high power seekers. Dell's philosophy is that if you're going to purchase a very fast machine, you might as well include the best available components for ultimate performance.

We tested the machine using a variety of 2D and 3D benchmarks as well as OpenGL and DirectX games to gauge performance, and we were quite impressed with the results.

In the 2D realm we used PC WorldBench 98, PC WorldBench 2000 as well as SYSMark 2000. In PC WorldBench 98 a record score of 346 was achieved, making this PC 8 per cent faster than the previous record holder, which was also a Dell Dimension — the XPS B-800r. Our sister publication in the US recently conducted its own tests on 1GHz machines using PC WorldBench 2000: their pace-setting machine, an IBM Aptiva with 128MB of RDRAM, produced a score of 165. In our tests, the B-1000r ended up with a score of 172 — almost 5 per cent faster. We can't as yet compare results of the SYSMark 2000 tests, but the machine recorded a score of 187 in this benchmark.

For our 3D tests we used Mad Onion's 3DMark 99 Max as well 3DMark 2000, and the machine produced 7322 and 4811 3D Marks, respectively.

As a gaming machine, this unit is unparalleled — the 1000MHz CPU pushed Quake II over 236 frames per second at a 640x480 resolution setting, using OpenGL acceleration. At the other end of the spectrum, the 64MB DDR GeForce came into its own, providing 59 frames per second at a 1600x1200 resolution setting. The main purpose of having so much graphics memory (and such fast memory) is so you can immerse yourself in the game you are playing, using high resolution and maximum texture detail. We played NBA Live 2000 — a Direct3D-based, fast-paced basketball game — at an unbelievable 1600x1200 resolution with maximum texture detail. We were blown away by the smooth gameplay and graphical detail that this machine provided at such a punishing setting. Likewise, when we ran Soldier Of Fortune at this setting, we experienced no performance glitches at all — although we had a hard time trying to locate the small dot required to aim at bad guys, and had to change it to a circle.

A good quality monitor is essential to reap the benefits that this graphics adapter has to offer. Dell shipped the machine to us with a 19in Trinitron display having a crisp 18.1in viewable area. For the complete aural experience a great set of speakers is required — and that is exactly what you get with the Altec Lansing ADA-885 Dolby Digital speaker system. They include a sub-woofer and four satellite speakers which are THX certified to provide you with theatre quality sound in your own home when watching DVD movies.

The case housing all the system's components is a solid little enclosure, which is quite easy to work on despite its small stature and footprint. The side panel removes easily, and is held on by one thumbscrew. The front panel also comes off easily, to expose more of the drive bays and make drive addition or removal a quick task.

Status lights on the rear panel of the case help troubleshoot no-video errors if technical assistance is required from Dell staff. All the regular PC connectivity options — including one parallel, two serial, two USB and two PS/2 ports — are offered.

A Logitech Mouseman wheelmouse handles your point and click action. It has three buttons as well as a scrolling wheel, and is quite comfortable in the hand. The keyboard is a Dell Quietkey keyboard, which, surprisingly, has no multimedia or shortcut keys.

With so many good points, it's hard to go wrong with this system. The only question is — can you afford it? The exorbitant cost of RDRAM has plagued this system with a huge price tag of $8518. The machine comes standard with a three-year (one year on-site) warranty, and a bundle of Microsoft productivity software is included. ■

– Elias Plastiras

SurfSaver Pro 2 and Web Space Professional

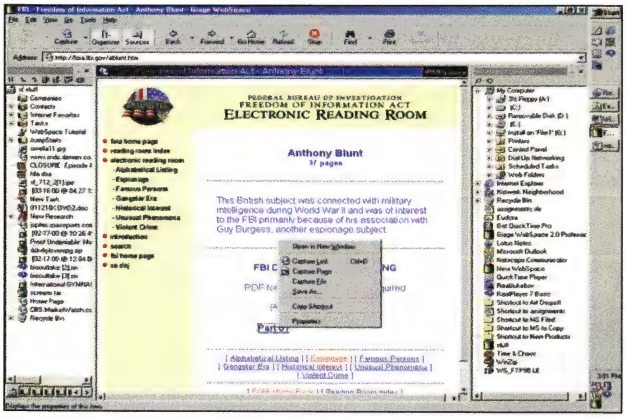
WEB UTILITIES

in brief

AskSam Systems
SurfSaver Pro 2
Price: $US30
URL: www.surfsaver.com

Giage WebSpace Professional
Price: $US179
URL: www.webspace.com

Finding information on the Web is easy; organising it can be a nightmare. AskSam's $US30 SurfSaver Pro 2 and Giage's $US179 WebSpace Professional go beyond browser bookmark tools to help you save and organise information — in very different ways.



File anything: store and organise related Web content, e-mail, and even contact information in multi-panel WebSpace Professional.

SurfSaver Pro 2 adds special search and page-save features to Internet Explorer that permit you to store material in a virtual file cabinet. You can share files with users on a network, and assign keywords, notes and other properties to pages — useful for subsequent searches. Links on saved pages remain live; when you click one, SurfSaver checks for a local copy. A free desktop-only version of the program displays ads while saving content.

WebSpace Professional incorporates Internet Explorer technology into multi-panel WebSpaces (virtual file cabinets that differ from SurfSaver's). You can collect information from such disparate sources as the Web (while you surf), e-mail, and your contact database. And you can view Outlook 2000 e-mail and contacts from within WebSpace.

While SurfSaver and WebSpace handle many complex Web formats, both stumble on JavaScript. WebSpace does recognise more types of files, but it lacks an internal search engine — which is a feature of SurfSaver.

If you need instant archiving of basic Web pages, SurfSaver Pro 2 qualifies as an excellent solution. WebSpace Professional, on the other hand, is worth a look only if you can take advantage of its Outlook integration; otherwise, you'll find similar help for less money elsewhere. ■

– Melissa J. Perenson

WinFax Pro10

FAX SOFTWARE

in brief

Symantec WinFax Pro 10
Price: $120
Phone: (02) 8879 1005
URL: www.symantec.com.au

Most fax software makes sending and receiving faxes with your PC possible, though not exactly uncomplicated. The unrivalled flexibility and intelligence of Symantec's WinFax Pro have long set it apart from the crowd. The latest version adds several welcome new features, as well as support for Windows 2000.

WinFax Pro 10 lets you send faxes as e-mail attachments, complete with a built-in 60KB viewer, to people who don't have fax numbers. This feature can be convenient if you want to send a scanned or electronically generated image of a document rather than editable text — or if you plan to transmit a document to multiple recipients, some of whom lack fax machines. Also new is a photo-quality mode, which reproduces illustrations and photographs much better than standard fax mode (though the faxing time doubles).

Other improvements: the program can now draw fax phone numbers directly from the address books of Outlook Express and other popular personal information managers. A software mechanism will delete faxes from known junk-fax phone numbers.

My shipping copy locked up during one test of the e-mail fax feature (though it worked fine on subsequent attempts), and sometimes WinFax Pro inexplicably invoked the log-in routine of Outlook Express. Symantec said it was looking into these problems.

Despite these rough edges, WinFax Pro 10 remains king of the fax programs. A price of $169 may be the package's biggest drawback for new buyers; owners of all earlier versions can upgrade for $79. That offer helps make the upgrade sensible for serious fax users. ■

– Mitt Jones

Now APC gives you desktop power protection starting at $200

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In a study by Energy Australia* the average power outage in Sydney and the Hunter region was 54.5 minutes, occurring 2.3 times a year. That's a staggering 2 hours of downtime annually, not to mention potential dataloss and hardware damage. Now the company that brought you Smart-UPS, the power protection choice of 2 out of 3 network managers, brings you the same reliability and performance in two affordable UPSs designed specifically for PC's and advanced workstations. Introducing APC's Back-UPS and Back-UPS Pro power protections solutions!

Back-UPS and Back-UPS Pro innovative features provide complete protection for your PC environment.
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In addition, Back-UPS Pro provides DoubleBoost Automatic Voltage Regulation, correcting over and under voltage conditions without battery drain. Cellguard™, intelligent battery management increases battery life while reducing cost of ownership. Internet ready fax/modem protection, protects internal and external modems, your motherboard and other system coponents with fax or modem line surge protection. And with FREE PowerChute *plus* power management software Back-UPS Pro allows unattended system shutdown for Windows 95 and Windows NT.

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Macromedia Director 8

MULTIMEDIA SOFTWARE

Macromedia Director 8 — in brief
Price: $1895
Distributor: Firmware Design
Phone: (02) 4721 7211
URL: www.macromedia.com.au

When it comes to creating multimedia content, Macromedia Director has absolutely no peer. Now in version 8 for both the Macintosh and PC platforms, Director has matured into a comprehensive package no self-respecting multimedia producer should be without.

Version 8 has brought a heap of goodies into its toolbox — and it is one of the first programs to support the Velocity Engine technology on the Macintosh. While some of these new features could be seen to be obvious enhancements, there are certainly some that make the upgrade worthwhile.

One of the most important changes is the addition of a Property Inspector. Whereas in previous versions it was necessary to view and change different Director elements using a series of dialogue boxes, the Property Inspector is now a single tabbed palette. Depending on the nature of the object selected, the Property Inspector displays relevant category tabs and fields for that object. This one feature alone dramatically speeds up workflow.

Also new is the Cast List view, which lets you sort cast members by name, size, dates, type and comments.

For greater control when creating a movie, you can now zoom in and out of the stage area in Director without affecting the position and size of sprites. And those users who have inadvertently modified a complex sprite, before realising it was the wrong one, will appreciate the new Lock Sprites command. Also of great assistance, and long overdue, is a Guides command (in addition to the normal grid) which lets you place sprites precisely on the stage.

New enhancements have been made to the Lingo language, including parent-child scripting functionality, image manipulation and sound control. In addition, scripts can be saved externally as files and edited in a text editor.

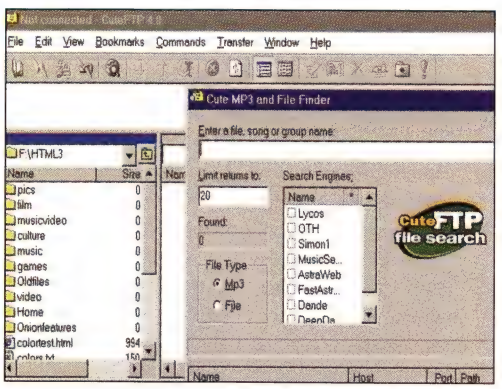
Director 8 now lets you configure a completed Shockwave movie in a browser. Options that can be changed include creating an HTML template file as well as the Shockwave movie, showing a progress bar as the movie loads, cantering the movie and many more.

Other enhancements to Director 8 include refined bitmap compression, multiple curve vectors, support for Japanese double byte characters, low bandwidth transitions and runtime imaging effects. ■

– David Hague

CuteFTP 4

FILE TRANSFER SOFTWARE



CuteFTP 4 — in brief
Price: $60
Distributor: GlobalScape
URL: www.globalscape.com

The release of CuteFTP 4 rounds off a significant number of improvements in this robust FTP program over the 12 months. For years, it has introduced beginners to FTP and is clearly gaining the edge over competitors such as the very clunky WS_FTP.

There are two main reasons that users would need an FTP program: to maintain a Web site, and to download files (mainly MP3s). With a built-in MP3 search engine and a simple explorer-like interface, CuteFTP is the ideal tool for both these tasks. Gone are the days of manually setting up a site with daunting Unix commands, as a simple right-click will automatically handle these tasks. A handy bookmarking feature allows quick access to sections on a site. CuteFTP has a range of tools for managing file transfer, including the ability to resume with auto-connect (even if your ISP drops your connection), scheduled file transfer, and — if needed — a simple right-click that will send a file from your desktop PC to the remote server. Other time-savers include directory synchronisation to keep your desktop files up to date with the server, macros for preforming routine tasks, and a handy option to preserve the casing of file names and folders, which is essential for Unix servers. One dangerous feature is the on-the-fly HTML editing — it allows you to modify the HTML on your live server. If your connection is dropped or visitors appear while the page changes are made, then the site may be affected.

Other minor improvements include a better interface, totals for queued files and improved 'stealth' pinging to keep your connection live. CuteFTP will also check for software updates or patches and download them if required. If you have version 3.x, then 4.0 is available as a free upgrade. While available locally for around $80-90, you can save a few dollars by installing the shareware version from the cover CD and buying a key from **www.globalscape.com** for about $A60. ■

– Scott Mendham

Castlewood Orb 2.2GB USB

REMOVABLE STORAGE

in brief

Castlewood Orb 2.2GB USB External
Price: $599 including one 2.2GB cartridge, 2.2GB cartridge $99
Phone: (02) 9453 5952
URL: www.castlewood.com

As the files transferred between PCs get bigger, so, too, do the mass storage devices we use to transfer them and back them up. The Orb is a 2.2GB drive based on magnetic media, giving higher speed than optical storage solutions. While USB gives the drive greater flexibility, it also introduces a speed penalty.

The USB version of the Orb supports both PC and Macintosh platforms. With its 130cm cable, the Orb should be a comfortable fit for most desktop setups. The Orb actually has a SCSI interface, which is converted to USB by an adaptor built into the cable, meaning that you can also use it as an external SCSI device. You could even daisy-chain a number of these drives and connect the whole string to the computer through USB, if you wanted.

The installation instructions are very detailed, but could be confusing to computer newcomers, especially since the adapter cable and the location of the drivers were different from the descriptions in the manual. Apart from this, the installation went smoothly.

The speed of the drive was somewhat slower than the SCSI version of the same device, taking three and a half minutes to write 100Mb, but only two minutes and five seconds to read the same amount of data. This is about average for an external USB drive, since data transfer rates are limited to a maximum of 12Mbps.

The data cartridges have an unusual shape, and the drive makes interesting sounds when you insert one. The Orb also has some visible moving parts under its rounded, translucent casing, so I'd have to say this is one of the more entertaining mass storage devices on the market. While the Orb is slower than its chief rival, the Iomega Jaz, it's also quite a bit less expensive. ■

– Aldis Ozols

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HP DeskJet 930C

INKJET PRINTER

in brief

HP DeskJet 930C
Price: $449
Standard ink cartridges $64.95 each
Distributor: Hewlett-Packard
Phone: 13 2347
URL: www.hp.com.au

Specifications
Resolution: 600x600dpi black, 300x600dpi colour
Paper size: width 77 to 216mm, length 127 to 356mm
Onboard memory: 4MB
Interface: USB and parallel

The DeskJet 930C, weighing just under 6kg, feels somewhat heavier than the average inkjet printer of this size, which is hopefully an indication that there's lots of good stuff inside. Its stylishly rounded grey casing holds one black economy cartridge and one colour cartridge, making it suitable for both office correspondence and colourful imagery.

The printer is accompanied by illustrated poster-size Quick Start leaflets for both Mac and Windows systems, and following the steps on them led to a quick and painless installation. An interesting minor feature is an adhesive plastic pouch containing basic help information and technical support phone numbers, which you can stick to the printer.

The ink cartridges each come with an illustrated installation pamphlet, as well as further diagrams on the cartridge itself. Hewlett-Packard is making sure that nobody has an excuse to get this bit wrong, and it's certainly a very user-friendly installation process.

Connection to the computer can be made by either USB or parallel port — cables are not supplied, so you'll have to decide which method to use and buy an appropriate one. They can be obtained from almost any computer dealer for under $20. The fact that the 930C has two different input sockets gives rise to the prospect of printer sharing on the cheap for your home office, by simply connecting one computer to each socket.

Testing the printer with both connections revealed no great speed difference between the two: an A4-sized photo print took two minutes and eight seconds, while, using USB, the same picture printed in one minute and forty-eight seconds. There is a slight speed margin in favour of USB, but it's nothing to get excited about; in any case, the general versatility and simplicity of USB are good enough reasons to prefer it to a parallel connection.

There was one paper jam during testing, which turned out to be caused by trying to put too much paper into the tray at one time. The unusual front-loading tray can hold 100 sheets, but due to the narrow opening it's best to insert them in three or four instalments. With this lesson learned, there were no more jams.

The colour print quality on plain paper was quite good, with only the faintest banding visible under close examination. Colour gradation wasn't perfect, but given that the ink cartridges supplied aren't specialised for photo printing, it was good enough. Black printing was suitably crisp, with edges which only revealed roughness to the naked eye at distances less than those normally used for reading.

This is a fine general-purpose inkjet printer, and for those who are a bit shy of technical things, it's also very easy to set up. ■

– Aldis Ozols

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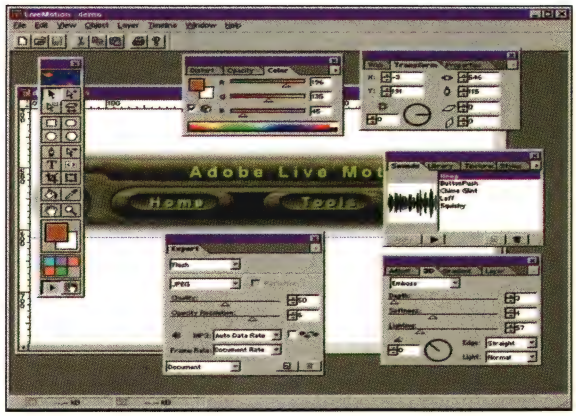
NET5197D

Adobe LiveMotion

WEB GRAPHICS AND ANIMATION SOFTWARE



Adobe LiveMotion's animation and interactivity capabilities rival those of Flash.

Users of Macromedia Flash will certainly want to take a look at a new offering from Adobe called LiveMotion. Flash has become the *de facto* standard for streaming Web animation and interaction and, until now, has had the market to itself. LiveMotion, however, is a serious competitor.

Able to export files to both versions 3 and 4 of the open standard SWF Flash Shockwave format, LiveMotion borrows heavily from the Adobe After Effects look and feel with the familiar "twirly" drop-down menus and time line metaphor. In addition, Adobe has utilised its expertise gained in such applications as Photoshop and Illustrator to add a robust and intuitive set of drawing tools that allow very complex images to be created in LiveMotion.

As well as the standard drawing tools there are also separate palettes for 3D effects, gradients, transparency, sounds and other special effects to be added to objects.

Creating animations is simple. Just select an object (or group of objects), set the timeline marker in the desired place in the length of the animation and change a property. For example, if an object is designed to fade in from 100 per cent (invisible) to 0 per cent (visible) over 10 seconds, at the start of the animation the object's transparency value is set to 100 per cent and set to 0 per cent at the end. Just about any property of an object can be animated in this way, including text values changing over time.

Objects can also contain different "states", from which actions can be triggered. A simple use of states is when an object is designated as a button. When the button is in the "up" state, a text box containing a description of the button may be hidden. When the button is in a "hover" state — that is, the mouse pointer is within the boundaries of the object on a Web page — the text box could be made visible. When the state is "clicked", the browser may be told to load another URL, play a different animation or perform some other action. If more complex operations are required, LiveMotion supports the industry standard JavaScript language.

LiveMotion is very easy to pick up and intuitive in its operation. The tutorials are excellent, allowing even a beginner in a keyframe-based application such as LiveMotion to come up to speed very quickly. ■

– David Hague

in brief

Adobe LiveMotion
Price: $595 approx.
Phone: 1300 550 305
Platform: Win 9x/NT/Macintosh
URL: www.pacific.adobe.com

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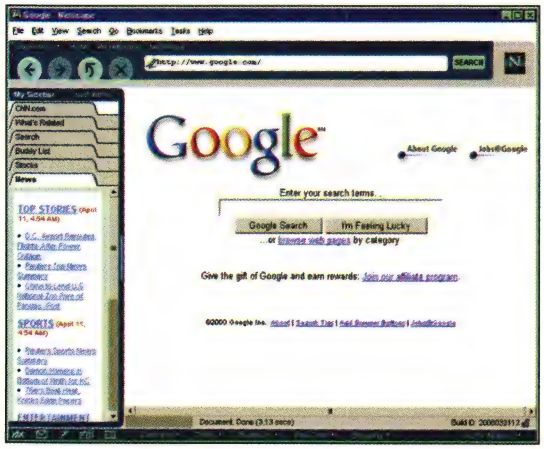
Netscape 6

WEB BROSWER

Netscape 6 in brief
Price: Free
URL: www.netscape.com

Netscape is back. After three years with nothing but point releases, the browser that helped put the Web into gear is revving up again — so radically altered that its creators decided to change its name and skip a release number. Instead of Netscape Communicator 5, we have a simple, straightforward Netscape 6.

The changes are dramatic indeed, including a slimmed-down profile (the download is less than half the size of Communicator 4.7's), a slicked-up user interface, the first third-party America Online e-mail client and an intriguing combination of Web search tools and instant messaging.



Thin is in

A look at Netscape 6's first preview release reveals that the intention is to get back to browser basics. For starters, it's compact in a way browsers haven't been since the glory years of Navigator 2: the full download of Netscape 6 tops out at 8.5MB, compared to 18MB for the bloated Communicator 4.7 and 29.4MB for the soup-to-nuts IE5.

Netscape 6 got thin by dropping Communicator's least-used components (when was the last time you invoked Netcaster?) and by abandoning Communicator's HTML rendering engine in favour of the newer and nimbler Gecko browser technology.

Gecko is not only smaller but is also faster than its Communicator predecessor: given equal network conditions, complicated Web pages load more quickly with Gecko, although we didn't put this early version to formal tests.

The attractive interface offers lots more customisation options than does the competition. The most prominent is My Sidebar, a collection of small, tabbed windows (Netscape calls them tabs) on the left side of the screen that hold Web information and applications you want to access with a minimum of fuss.

Netscape 6 comes preloaded with a handful of tabs — customised minipages like the Web clipping service provided for Web-enabled mobile phones. Netscape provides tabs for CNN headlines and stock quotes from your Netcenter portfolio, and you'll be able to get more tabs from Web sites that offer them. Netscape says more than 400 tabs will be available at launch.

If you don't want to see My Sidebar, it collapses with a simple mouse click on the side of its frame; no labyrinthine menu item check-offs are required.

Netscape 6 is the first major update to Netscape's browser since AOL acquired the company in 1998, and several features reflect AOL's influence.

For example, one My Sidebar tab is the Buddy List, which lets you send instant messages to other AOL/Netscape Instant Messenger subscribers from within the browser — and not just the browser on your computer. Buddy Lists are now stored on Netscape's servers, so you can access them from any IM-equipped PC.

Even cooler: when you compose messages in Netscape Mail, the software checks for recipients who are on your Buddy List; if they're online, you can send the e-mail as an instant message and start a chat session, perhaps circumventing some time-consuming e-mail exchanges.

Netscape Mail delivers several other new goodies, not the least of which is the ability to send and receive your AOL e-mail (no big surprise, of course, since Netscape is now an AOL subsidiary).

You can now manage multiple AOL and POP3 e-mail accounts, with separate inboxes and folders for each one. That feature, which most major e-mail programs don't offer, is useful if you'd like to keep your personal and business e-mail completely separate without resorting to filters.

A popular feature of most newer e-mail programs is also included: when you read a message, Netscape automatically stores the sender's address so you can send them mail later by simply typing the name in the To: field when you start composing. Filters to sort mail into folders as it arrives would have been nice, but otherwise Netscape Mail is a very usable basic e-mail client.

Search me

Netscape has tried to make searching as easy as possible, but the result is mixed. You can perform certain specific searches by using special keywords. For example, if you're shopping for something, type **shop** or **buy** along with the name of the item in the URL bar and Netscape will bring back results from AOL's shopping search engine. Similarly, typing **quote** in front of a company name brings up the price of its stock.

You can hit a button to get additional results, which start with a list of sites reviewed in Netscape's Open Directory project — a Yahoo-like catalogue with write-ups by volunteer editors. Those results also appear in the Search tab of My Sidebar, where they remain until you search on new keywords.

You can refine your search by

category — Art, Science, Reference and so on. Eventually, you get another button that lets you search with Google, a popular and effective search engine.

Additionally, you can configure Netscape to search several sites at once, but some of those sites aren't search engines (MapQuest and Netscape Jobs, for example). Most annoyingly, you can't choose a different search engine as the default; you can only bookmark it.

Netscape 6's security options represent a significant improvement over Communicator 4.7's, and they match or exceed those in IE5. You can automate site log-ins via a master password and set cookie controls on a site-by-site, per-cookie basis.

Other components and features include Composer, a serviceable Web-page authoring tool along the lines of Front Page Express; Net2Phone software for Internet phone calls; and a translation command for conjuring up computer-generated versions of Web pages in foreign languages (this wasn't ready for testing in my pre-pre-release copy).

Preview release 1 isn't without the usual clumps of beta bugs and there are a couple of built-in irritants. In a package with so many new features, there's a glaring lack of tool tips to help you learn. It's not always obvious how to use the new customisation options. And now that AOL's Buddy Lists are part of the package, why not import the lists people already have on their hard drives? These are the sorts of complaints that discourage people who experiment with new software, and Netscape 6 may prove no exception.

Netscape 6 is launching simultaneously for the Windows, Macintosh and Linux platforms. The Gecko engine has no serious competition yet from Microsoft's Windows CE in the Web appliance universe, where Linux is rapidly gaining popularity.

So, even if Netscape 6 isn't your desktop browser choice, don't be surprised to see it on a TV set or mall kiosk in the next couple of years. And if you've stayed with Netscape, you have some good new reasons for sticking to your guns. This lean, smart browsing machine should be a powerful contender. ■

– *Yardena Arar*

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TECHNOLOGY WITH A CONSCIENCE

Beware of the speedbumps

BY BEVERLEY HEAD

Telecommunications company UUNet spruiks that, in the future, every device connected to mains power will have an IP address. It is a world where the television and the computer merge; where utilities piggyback information services to each and every home and office thanks to existing access; where telecommunications companies offer integrated services; where global Internet service companies emerge to provide robust secure international Internet backbones; and where global content giants such as AOL Time Warner flourish.

It is, says UUNet, "the golden age of communications."

The company was one of a host presenting their visions of the future, or peddling new products, at the now2000 conference organised by the Australian Telecommunications Users Group and held earlier this year.

Besides UUNet's wired world, plenty of companies were demonstrating how wireless communications will develop, with a particular focus on third-generation wireless where high-speed data and multimedia can be transmitted over high-bandwidth mobile wireless networks.

According to telecommunications analyst Paul Budde, demand for mobile wireless is on the march. He predicts that this year the number of Australian mobile subscribers could grow by 20-25 per cent if there is more call charge competition. Whatever happens to call charge competition this year, by 2001 he expects the price of mobile calls to be at or below the cost of fixed wire calls. Clearly, once that happens more and more communications will be transferred to the mobile networks.

In addition to handling pure voice calls, those mobile networks are increasingly being called on for data transmissions — and eventually will also have to handle video.

Orange's view of the future, which was demonstrated to conference delegates, was of a world where wire-free communications were as simple and reliable as wireline services. In a five-year vision, the company predicted a world where individuals would be constantly connected to communications networks through wearable electronic devices, which would allow access to voice calls, the Internet and video.

The company will shortly unveil in the British market its first videophone.

Australians might also expect to be able to buy a TV phone here before the Olympics, according to Samsung Electronics. The company expects that it will team with a mobile carrier before September in order to be able to package the phone (which can be used for standard telephone conversations, but also to access free-to-air television) in a deal which would see it retail for around $400.

For about the same price, consumers might also be able to buy Samsung's watch phone, also scheduled for local release before the Olympics.

Longer term (the company is predicting another two years) it will release its third-generation telephones, which will allow people to surf the Net, download video, and — using a built-in digital camera — record and send images. This third-generation phone is also being developed with true global roaming as a goal.

Les Chapman, director of Samsung's telecommunications division, is, not surprisingly, enthusiastic about the opportunities for mobile telephony, citing statistics which show that by 2005 there will be 1 billion users of mobile phones in the world. He believes that the communications, entertainment and information package presented by the new TV phones (and the next generation of Internet/video phones) will be attractive to all sectors of the consumer market.

The electronics are out of the laboratory. But the infrastructure is still wanting.

Telecommunications carriers, which have already $US1 trillion worth of infrastructure in place the world over, admit that it will be probably at least five years, and possibly more, until they can offer the reliable, high-speed, high-bandwidth, seamless networks required to underpin such applications, at a reasonable cost.

The information infrastructure is also still in development. For a truly seamless communications environment, people will want to be able to access all those devices with an IP address in a standard way. They will want to be able to retrieve information stored on their personal computers, on corporate databases and on the Internet, again in a standard way.

Consumers might also be forgiven for wanting more information about the potential health risks associated with the electromagnetic radiation that comes with intense mobile telephone use.

As with all technological development, there will be speedbumps along the way, but the future will prove unstoppable. ■

Beverley Head can be contacted at: bmhead@ozemail.com.au

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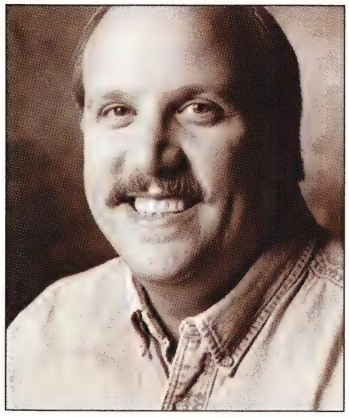
Who is winning the desktop race?

BY NICHOLAS PETRELEY



It seems that someone writes at least once a week to tell me why Linux can never succeed on the desktop. Invariably, the proof they offer is in the form of a list of the problems they had installing and running Linux or Linux applications.

Before I continue, let me be clear that I'm not trying to discourage people from writing in with a question about how to solve problems they encounter in Linux. By all means, keep sending me your issues (and tips), and I'll do my best to address the most common problems in future instalments.

Rather, I'm talking about those people who are not interested in making Linux work, but instead are trying to evaluate Linux based on their single data point. Nine times out of 10 the author relates a horror story about installing Linux or trying to get Linux to print to this or that printer. I've no doubt that these stories are true. Most of them involve notebook computers, an unusual bit of hardware, or an old version of Linux. But make no mistake: some of the problems involve the best Linux distributions and the most common hardware.

Allow me to balance your data points with a few of my own. I've been using Linux for several years. It has been my primary desktop operating system for almost two years, meaning that I do all of my work, but only some of my play, using Linux. Although Netscape has crashed countless times (as it does under Windows), none of the Linux distributions I use has crashed in the past two years. I have had to reboot to solve a problem only once — and that problem was self-inflicted. I forced Linux to load an outdated sound-card driver in the false hope that it might work. Everything worked fine, even with the bad driver loaded, but I had to reboot for the system to unload it.

In contrast, despite making all the recommended printer settings changes, Windows 98 SE often generates out-of-memory errors when I print to my Hewlett-Packard LaserJet 6MP. Linux prints the same documents without problems on that printer. My Windows 98 SE machine still refuses to shut down even after applying the appropriate Microsoft fix for this problem. A consultant I know has 50 machines with the same problem. As for stability, we have three Windows 98 boxes that crash so often my three-year-old son now says, "It crashed," when I switch off a TV program. Windows NT is better, you say? According to a data point given by Bill Gates, 5.2 days is the uptime benchmark one should use for Windows NT when comparing it to Windows 2000.

We have three Windows 98 boxes that crash so often my three-year-old son now says, "It crashed," when I switch off a TV program.

You say there isn't enough desktop software available for Linux? Here's what I use (you can find any of these packages by visiting **www.freshmeat.net** and entering the name as the search term). In order to remain current with what is available, I use a variety of window managers and graphical desktops including Enlightenment, Gnome, KDE, IceWM, WindowMaker, and Xfce.

I use a wide variety of productivity software to get my work done. Most of my e-mail gets done thanks to a program called Mutt, but I usually recommend the less esoteric Netscape Mail or any of the other graphical mail clients for Linux. My Internet browser is Netscape. I plan to switch to Opera when it becomes available. I'm using StarOffice to write this column, and I also use it to create and give presentations. I use Gnumeric to work with Microsoft Excel spreadsheets. I just started using a program called jpilot for my calendar, notepad, to-do list, and address book. It synchronises everything with my Palm. I use CompuPic to view and organise graphics files and Gimp to edit those files.

I ran a program called ripperX this morning to convert all the songs on a Steps Ahead CD to MP3 format so I can listen to the music at the computer without having to remember to bring the CD into the house from my car. I use the program xmms to listen to these songs. I use Xcdroast and Gnome Toaster to back up data to CD-ROM disks.

Does my single data point mean that Windows is unusable or Linux has come of age on the desktop? Of course not. But keep it in mind the next time you want to come to blanket conclusions to the contrary. ■

Nicholas Petreley can be contacted at: nicholas_petreley@infoworld.com

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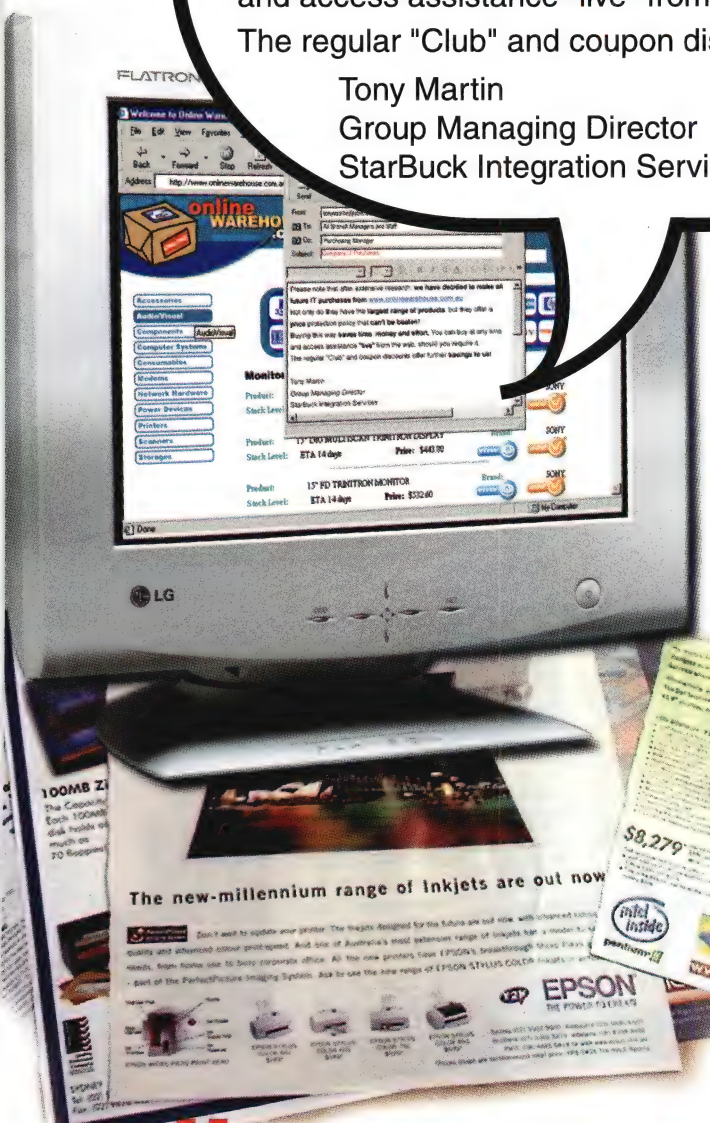

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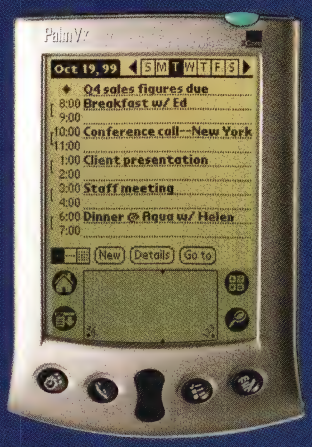

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When did phones become Nikes?

BY MARK STAFFORD

I went to buy some sports shoes. There amidst a wall of design choice — Nike, Reebok, Asics, Puma, Adidas, running, walking, cross-training, hi-top, low-top, gel, pump and hydroflow — I wondered when men started to care so much about shoes. Wasn't that something that made us different to women? Shoes are such utilitarian things, but now we care that we have the latest model footwear and we pay a lot of money to get them.

And so it is with mobile phones. There is no gender parallel here, but who decided that a phone should be a designer statement? You answer it when it rings and push buttons to make a call. Why does it have to be fashion accessory?

Making the mobile a designer statement is clearly the brief for creators at the phone companies.

Motorola says you should "Stand out when you speak up". Nokia says they've "seen that you have your own style. And you want a phone that complements you. Stylish, intelligent and straight to the point". And Ericsson sells phones with "utterly modern colours — Urban Grey, Marble Beige and Mountain Heather". Mountain heather?

The basis of design differentiation is usually the pursuit of individuality — to stamp your identity on an object. This is also the source of those God-forsaken ringing tones. Late last year I heard something I doubt I will hear this millennium: I heard a mobile phone ring. Actually ring like phones used to do, not "play" "Waltzing Matilda" or "Yellow Rose of Texas".

While sitting with a couple of friends at the pub last week, a person at the next table played all the tunes on her mobile, one after the other. We finally cracked and asked her to stop, claiming that no-one's definition of a relaxing weekend drink included tinny digital versions of "Happy Birthday", "Auld Lang Syne" and "Flight of the Bumblebee".

But she wasn't to blame — it's the phone designers who put them in the phone. I refuse to believe that Nokia received lots of letters years ago, when they were dreaming up their first mobiles, along the lines of: "Please Mr Nokia, when you design your mobile phone, it would be great to include tacky electronic versions of tunes that no-one likes and have a universal ability to make people wince. These would be particularly useful for calls received on public transport. I would especially like "Jingle Bells"."

Let's face it: there should be mandatory sentencing for the person who allowed Casio-tone versions of "Shave and a Haircut" and "Ride of the Valkyries" to come from a phone.

And now we are supposed to embrace WAP (wireless application protocol) on our mobiles. Good technology — and by that I mean the considered marriage of form and function — should excite us. Television excited people when it arrived, the Internet excited people, but WAP makes me yawn. Stock quotes, horoscopes and weather reports on my mobile phone? Unless I am grossly mistaken, there are still a few mobile users who don't sit in cafés all day, monitoring their equity portfolios and watching out for hailstorms that could pulverise their BMWs. If the WAP people added some local traffic updates, TAB results and surf reports, it would be marginally more useful, but that sort of content sounds a bit low-brow for the current service providers.

The real challenge for WAP is retail, which is the Holy Grail for all dot-com frenzy. Just think about how you shop: if you are fortunate enough to have a full-time job, shopping is essentially restricted to weekends, lunch breaks and some extended trading hours each week. Australians just haven't embraced mail-order shopping like the Yanks.

Now the Internet is tempting us with online banking, groceries, gifts and plenty more, any time of the day. The next step is WAP wanting you to shop when you're on the bus going to work, when you're walking the dog, when you're watching your kid play netball, and when you're changing lanes at speed in your 4WD, phone clamped against your ear. WAP is for retail anytime, anywhere.

All hope is lost for the mobile phone — the accessorisation cannot be reversed. Last week I saw a woman having a very serious conversation into a teddy bear held to her ear. Where will this madness end? Maybe not before we're all talking into Pokemon-shaped phones that play "Stairway to Heaven" when our stockbroker calls. ■

Mark Stafford can be contacted at: unharmed@hotmail.com

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Travelling on the Net

BY IAN YATES

If there's anything guaranteed to test the reliability of the systems you take for granted, it's travelling. These days it really is easy to book a trip using one of the Internet travel sites. But have you ever changed your plans mid-trip? None of the Internet sites that I regularly use had any facility to rearrange flights and accommodation easily — if at all. It's not surprising that the Net doesn't let you make some of those changes — the airlines themselves had no end of trouble making changes and then getting those changes recognised at my next visit to an airport check-in.

It seemed that no one had a problem de-booking and re-booking my flights; the problem seems to be the paranoia about whether the airline is getting its required payments. So there I stood, booked on the right flight, while the check-in staff madly made phone calls to see if they could let me on-board without taking more money and, if money was needed, exactly how much money?

American Airlines took the prize this trip. They finally decided after 50 minutes of discussion that I could catch a particular flight, but they wanted $70 extra. Even though I was holding a $7000.00 round-the-world business-class ticket. The point was moot — by the time they'd calculated the price, the flight had departed. They'd rather have an empty seat than lose $70.00. No wonder they can't let you use the Internet for anything but up-front ticket purchase.

Hotels weren't a lot better, but the Holiday Inn in San Francisco at least made it easy to cancel and re-book my room. I didn't have the heart to explain to the desk staff that my surname and first name had been juxtaposed by their Internet booking program. "Welcome to San Francisco, Mr Ian."

When it comes to actually using the Internet while travelling, it is no wonder that Internet cafés are staggeringly popular with the backpack brigade. On balance, I think I'd have to recommend using a net café instead of fighting the phone systems in your hotel rooms. You'd think that with the arrival of the 21st century, hotels would know that most of their guests, not just their business travellers, probably have an Internet-enabled device with them.

The problem began with an upmarket hotel in London that required you to own the peculiar UK telephone plug. After sourcing one of those, which I'll definitely lose before I return to the UK, I discovered that the in-house phone system is so bad that 14Kbps is the best connection I can expect. And, of course, hotels persist in charging fantasy numbers for the use of their phone systems. £200 for 20 minutes of Internet access. I'm not joking.

At least over in e-Ireland they use ordinary phone connectors and only charged me a fiver for the same amount of online time I'd enjoyed in London. But why is the phone next to the bed while the power is next to the desk? If anyone had walked in on my Internet session I'd have had a lot of trouble explaining exactly what I was doing on the bed with cords wrapped around various limbs and a laptop perched on my chest — while swearing at random.

Of course, by the time I got to Phoenix, I expected the good old USA to be Internet aware and traveller friendly. Close, but no cigar. Standard phone connectors. Phone near one of the tables but not near the desk. Power reachable. Working on the coffee table wasn't so bad after my previous gymnastics. But how come they charge me $5.00 to call a 1-800 toll-free number? Exactly what service is the hotel charging me for providing?

Last hotel stop was San Francisco, and they had obviously visited Dublin and copied the room layout. Back to power and phone cords stretched across the room and me in the middle of the bed trying to read a laptop screen upside down. At least the 1-800 calls really were free this time. Not even a "service" charge.

Now, all this hassle could be easily fixed by any savvy hotel chain that cares to take the time and effort, and afterwards they should be able to rely on very loyal custom from anyone who needs to stay in contact while they are on the road. Any takers?

Finally, this road trip made me realise how inadequate my laptop and e-mail software are when asked to perform remotely. You've just got to have Web-based everything if you're on the road. That way you can use any damn gadget that you are offered that has a browser. Being tied to my laptop for access — and slow access most of the time — is seriously frustrating. Particularly with hotel phone-meters running. Before the next trip, I'm moving everything I need to Web-based access. I probably won't use the Web for everything all the time, but when you are on the road, it's Web or die. ■

Ian Yates is Editor of the Australian Industry Standard, which can be found at www.thestandard.com.au

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Readers forum

Technical value

I couldn't help noticing two letters, both of which referred to problems the authors were having getting their PCs upgraded ("Hardware Woes", PCW March 2000 and "A male domain", PCW April 2000). I have no doubt that there are many similar cases out there that we may never know about. One might ask, "Why do we have so many inexperienced people working within this industry?"

I believe that the answer could come down to dollars and cents.

I know a number of people who have abandoned (or would like to abandon) their roles as technicians (or "techos") because it simply doesn't pay enough these days. When you compare the salaries on offer for other IT-related positions (such as a Network Administrator or IT Consultant) it's little wonder that people aren't bothering to be a PC technician anymore, because their skills aren't valued enough. I am not saying that a technician should be (or expect to be) earning exactly the same salary as these other two occupations, but, at the same time, the average pay being offered to "techos" nowadays isn't all that attractive.

After all, when your CPU becomes too slow for your applications, or your workstation's network card won't allow you to access your make-or-break presentation (which is due in an hour) from the server anymore, you have two choices: upgrade/fix it yourself (if you have the time, parts and know-how) or call a competent technician to do it for you. And we all know what we'd opt for 90 per cent of the time.

It is only a matter of time until there is a shortage of good quality technical people out there — or is this time already upon us?

– Daniel Dovico

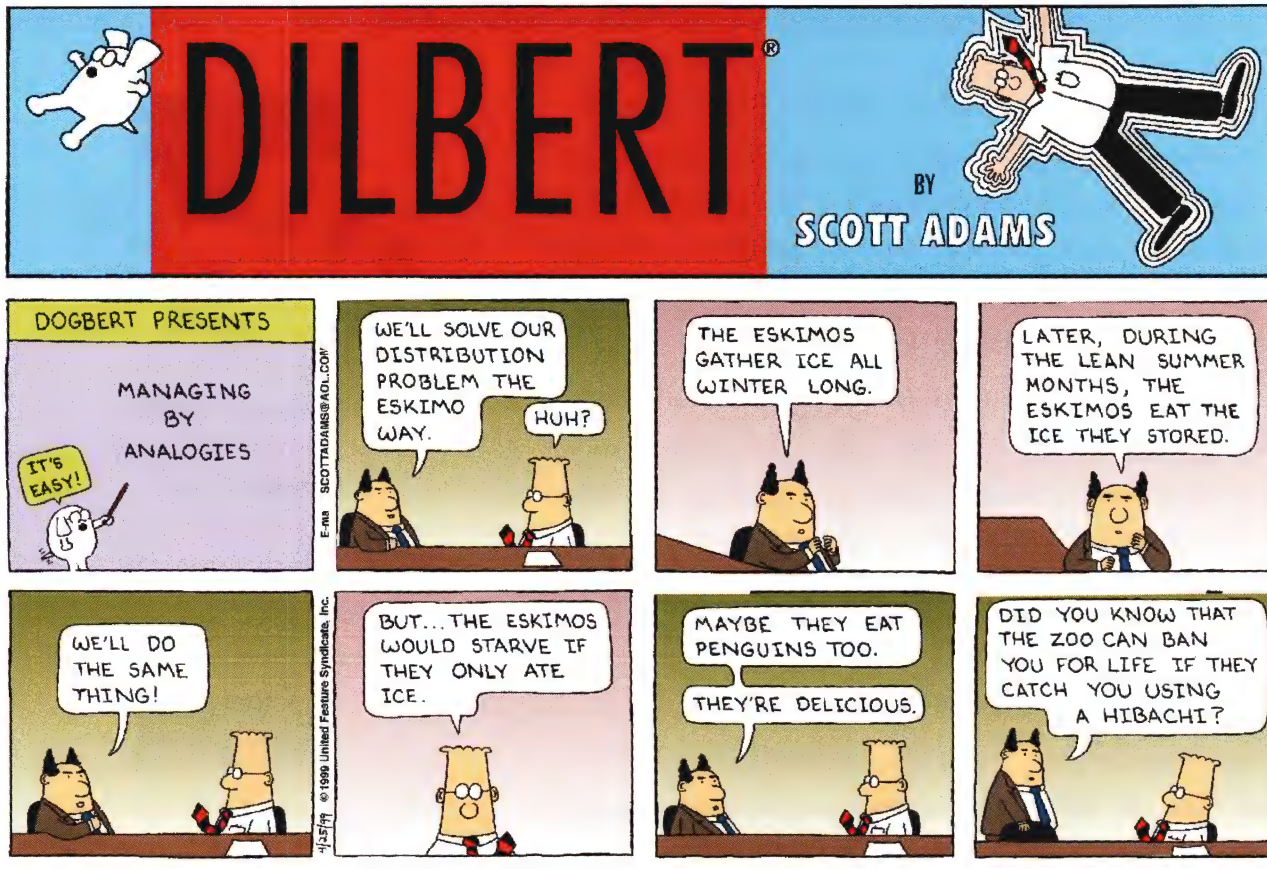
Correcting copyright confusion

I am the editor of Australian HI-FI magazine, and also a long-time reader of PC World.

I feel compelled to write to clarify a grave error published on page 56 of the April 2000 issue, which appears in a reader's letter, for which the reader, Chris Watson, won the "Missive of the Month" award.

Firstly, there is no "copyright levy" on blank tape in Australia whatsoever. This is completely incorrect. This being the case, there is no licence that allows Australian consumers to copy music onto tape, or CD, or MP3 or whatever. Such a levy does exist in the US, and was proposed for Australia, but the necessary law was never enacted in this country.

Secondly, Mr Watson seems to



think that it is legal to copy CDs that he owns onto his PC, and play them from that, or download those songs to an MP3 portable and play them in that. Again, he is completely incorrect.

In Australia, it is completely illegal to make a copy of any musical recording onto any medium — for any reason whatsoever — unless you have first obtained written permission of all the relevant copyright owners. So, contrary to what he claims in his letter, everything he is doing (and recommending others should do) is "100 per cent ILLEGAL".

I must admit to some amazement that a person who is both a musician AND operates a Web site is so ignorant of such basic copyright laws.
– *Greg Borrowman*

(PS: I'm sorry that my first contact with you had to be this e-mail. Otherwise, love the magazine.)

*(**Editor** — Thanks, Greg, for clarifying the current state of play in Australia. I also made a note of this in my editorial last month ("Music to my ears", page 12) when discussing the issues surrounding Internet music piracy.)*

An eisa experience

Having just purchased PC World, I thought that as you had almost two full pages on the OzEmail buyout by eisa (News analysis, April 2000, page 16), you might be interested to hear how eisa treats its customers, or some of us, at least.

I purchased a PC/Internet package deal in October 1999, and because I live in Caboolture (north of Brisbane) I had to use the Caloundra server. This is where the problems began.

I have never had any problem making a connection, but retrieving and sending e-mail, or surfing, was complete and total frustration. I was forever getting server failure messages, notification that I was no longer connected, POP3 has failed to respond, and every other possible server-related error message known to the cyber world.

Upon phoning to make a complaint, I was informed, "We are aware of the problem, and the equipment for the scheduled upgrade is onsite, but due to Telstra's inability to supply the men to perform the work, the upgrade isn't possible in the near future."

After threatening to take the matter further, I eventually struck a deal to purchase the PC outright, less Internet, and I have since returned to my previous ISP.

Therefore, all you current Oz Email customers who are reading this — keep on your toes.
– *Dale Schmidt*

*(**Editor:** At the time of going to press we were awaiting eisa's response to this letter.)*

Fast connection, slow customer service

With all this talk about which ISP is purchasing which, I thought this would be a great time to bring up my concerns with my current ISP.

Recently, I heard about Dingo Blue (www.dingoblue.com.au). They had a very attractive offer: $25 per month, providing you takes them as your long distance phone call provider. As I have two phone lines, one main line and one for Internet access, this was an offer I couldn't refuse. Later that week we signed up with Dingo Blue for local and long distance phone calls as well as Internet access.

But all was not a simple as it appeared. There were several major problems, all relating to their customer service (or lack thereof). To start off, all but one word of our personal details (name and address) was misspelled. With that sort of accuracy, I was surprised to see the letter actually made it here.

The letter made several references to a setup CD-ROM that would set up our computer so that it would be able to connect to the Dingo Blue network. With all these references to the CD-ROM, you would have imagined it would have been included.

The final problem I shall bring up (and by no means the final problem we encountered in our dealings with Dingo Blue) is the phone account. We had told them that the second (Internet) phone line is to be set up with their local and long distance calls. Later that week I checked our online bill and found that the primary phone line had been taken.

We rang them to ask them to revert the phone lines to their original state, but apparently they do not have the power to do that.

As you can imagine, we are very upset with Dingo Blue. After only three or four days we are already looking for a new ISP. The moral of the story? It probably has something to do with the importance of customer service over connection speed.
– *Byron*

Disabling call waiting

Just a quick tip for all your readers. We all know what a pain call waiting can be when it disconnects you from your hours of pleasure surfing. Especially if you have completed 99 per cent of that long awaited download.

There is a way to build a call waiting disable feature into your dial-up networking connection. Make sure call waiting is enabled, then, before you type in the phone number for your ISP, type *44 followed by a space then your ISP's phone number.

This will temporarily disable call waiting on that line, and automatically enables it when the modem hangs up. I have found this to work on a Telstra account but I'm not sure if it works with AAPT or Optus subscribers. It is definitely worth trying, as you need only enable call waiting once then forget about the hassles of turning it off when you dial up.

By the way, keep up the great work.
– *Brian Anderson*

missive of the month

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Cyber cents

MANAGE YOUR MONEY ONLINE

BY DAVID HELLABY

Last year 6 million Australian adults — or about 44 per cent of the adult population — accessed the Internet, but less than 4 per cent used the Internet for online banking. Our population remains suspicious of doing business online, and when it comes to putting our credit card number or bank account details on a Web site, some of us are downright petrified.

Sense and security

However, the same people will happily divulge their details to an anonymous person or machine over the phone, or hand over their credit card for someone to take an imprint and keep a duplicate of the card details. Last year 5.6 million people used a telephone to pay bills or transfer funds. What makes telephones more secure than the Internet? In reality, they are not. Modern encryption and security measures make Internet banking as secure, if not more secure, as any other method. In fact, analysts estimate there is a much greater chance of a customer being caught up in a bank robbery than there is of their bank account being hacked, providing they take standard, sensible precautions.

Despite their nervousness, twitchy consumers cannot take all the blame for the slow adoption of online banking in Australia and New Zealand. Most banks have delayed offering full Internet banking services until they were satisfied with the security they could offer. All now offer at least 128-bit encryption, with the National Australia Bank (**www.national.com.au**) offering 168-bit, which technically would require someone with a super computer and hundreds of years to crack.

Some banks have also implemented the use of virtual keyboards that move around the screen as you use them to key in passwords. The movement is designed to stop hackers using tools that steal your password by recording keystrokes on a standard computer keyboard.

Mobile banking

Despite the apparent reluctance of customers to bank online, every major and most middle rung banks in Australia and New Zealand now offer Internet banking, and soon you will not even need a computer to access the service. The major banks, in particular the Commonwealth and National Australia Bank, are already introducing mobile Internet banking services that can be accessed by WAP (wireless application protocol) mobile phones.

Mobile Internet banking is predicted to becoming increasingly popular as new-generation mobile phones filter into the market. From later this year, most new mobiles will be Internet-enabled, providing the capability to bank online. Even if you don't have a WAP phone, Internet banking will become increasingly available through next-generation automatic teller machines. Bank of Queensland (**www.boq.com.au**) recently formed a joint venture with Talisman Technologies, Saracen Financial Services and Compaq Australia to develop new ATM technology that will produce Web-enabled ATMs linked over a broadband network. The new machines will allow customers to perform a number of Internet-related functions, and the first of them will be used to replace existing BOQ ATMs. The rest will be owned by the joint venture parties and sold or leased to other financial institutions.

Whether we like it or not, the banking industry has decided Internet banking is here to stay. Not only is it more efficient, it is more profitable for the banks and, more

importantly, cheaper for the customer. Finance analysts estimate that it costs banks no more than a few cents per transaction compared to more than $1 for over-the-counter transactions. As a result, they can charge customers a fraction of the current charges, but make just as much profit, if not more.

For the consumer, Internet banking offers 24-hour-a-day access to their accounts and total control over the movement of money between them. They can transfer money from account to account, order chequebooks, download transaction records and bank statements, and even send messages to their bank. It also allows customers to keep a close eye on those sometimes-worrying direct credits they have felt pressured to accept by insurance companies, hire purchase financiers and so on.

Cutting costs

Online banking provides a convenient bill paying service that is both more efficient than cheques or credit cards and also much cheaper. The service called BPAY in Australia and Net Bill in New Zealand has a growing number of member organisations. There are now more than 2800 Australian companies, government departments and utilities that accept direct payment through BPAY, and using the service is a simple matter of transferring funds from your account to the creditor's accounts. It takes just a few seconds and your account with the organisations you are paying is credited instantly, so any delay caused by the cheque being "in the mail" is eradicated.

Regular users have found that having 24-hour access to their bank accounts can be beneficial in many ways. One way to make some quite dramatic savings is by regularly transferring any surplus money into mortgage and loan accounts, where it is more productive than sitting in an account that bears low or no interest. Making the equivalent of one month's extra payment a year on a 25-year mortgage can knock up to 10 years off the term of the loan, saving many thousands of dollars in interest.

Most banks provide similar services, allowing access to personal accounts, providing bill-paying services, online loan facilities and access to loan accounts. Although some banks restrict online banking to personal accounts, others will allow more than one nominated person to access business accounts.

Try before you click

Early online banking required special software, but with improvements in the encryption capabilities of later Internet browsers it is no longer necessary.

The most that banks such as the Commonwealth (**www.commbank.com.au**) require nowadays is the download and auto-install of a plug-in for Internet Explorer or Netscape, although some will require some minor and simple customisation of your browser's security settings. From then, it is a simple matter of registering as an online user.

Most banks now provide online demonstrations of their service and some, such as St George Bank (**www.stgeorge.com.au**), allow you to try it before you sign up.

Many people have been concerned about being able to keep a record of their online transactions; various banks have handled this in different ways, but all allow users to print out a record of their dealings. Some provide a record-of-transaction number, while others, such as the Queensland-based Heritage Building Society (**www.heritage.com.au**), automatically generate e-mail messages confirming each transaction.

The big four — Westpac (**www.westpac.com.au**), ANZ (**www.anz.com**), National Australia Bank and Commonwealth — allow users to export details of their accounts and transactions into home accounting programs such as Quicken and Microsoft Money.

Safe online

The banks have gone to great lengths to ensure any online dealings with them are secure; there are still some security risks, but most of those lay with the user. It is important to have an up-to-date antivirus program that will detect if your computer has been infected with any hacker tool; you should change your password regularly — every 30 days is recommended —

Bank	BPAY	Online statements	Transfers to third-party accounts	Multi access*	Fees**	Export to Quicken & MS Money	Online share trading	Share trade fees	Secure message system
ANZ www.anz.com	Yes	Yes	Yes	Yes	No monthly fee. 20c per withdrawal over monthly limit+	Yes	Yes	$39.50 per trade up to $40,000 Rebates for regular traders	Yes
CBA www.commbank.com.au	Yes	Yes	Yes	Check with bank	Fund transfers or bill payments may attract withdrawal fees	Yes	Yes	From $14.95 per trade up to $10,000	Yes
NAB www.national.com.au	Yes	Yes	Yes	Yes	No fees or transfer charges on personal accounts	Yes	Yes	$27.50 up to $13,500 0.2% above $13,500	Yes
WPAC www.westpac.com.au	Yes	Yes	Yes	Check with bank	Standard fees apply	Yes	Yes	From $15 for trades up to $15,000	Yes

*Provide account access to more than one person +Withdrawals include transfers from one account to another ** Government charges apply in all cases

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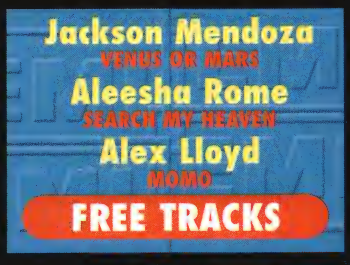

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* While stocks last. SA: T00/1356 ACT: TP99/3766 NSW: TC00/3580 VIC: 00/1516 Issued 12/4/00. NT permit pending.

Amount now due

Three main online bill-paying services are available to Australians:

BPAY has been established the longest and allows consumers to pay accounts to BPAY member organisations either online or by telephone. The service uses a combination of an organisation membership number and a customer account number to match up the payments with the appropriate parties. BPAY does not charge the consumer, who can make payments by direct debit or transfer from their bank account or by credit card.

E-BILL operates in a similar way but offers an expanded service that allows member organisations to send their accounts to the consumer electronically. Consumers receive, read and pay their bills online using the same methods as BPAY. E-BILL does not charge the consumer, although with both it and BPAY, banks and credit card companies may charge a transaction fee.

Allmybills.com.au is the latest bill-paying organisation and it goes even further than E-BILL, offering to manage all of a household's or small business's bills by having them redirected to a nominated GPO box number. Allmybills will then process the accounts and notify the consumer of their arrival, then post them online for them to be viewed and authorised for payment. Allmybills charges individuals $7.95 a month plus a transaction fee after the limit of 10 free transactions is reached. Small businesses pay $19.95 a month and 75 cents for every transaction.

and do not store your password on your computer or anywhere it can be accessed. Always log out of your bank account, rather than just moving to another site or closing your browser. If you don't, you may leave a door open for somebody else to access your account. If you are connected to a broadband Internet service it is essential to use a firewall. 'Always on' broadband services are much easier for anybody to break into because they usually have print and file sharing enabled, so it is necessary to have some form of barrier. For around $100 you can install a program such as Norton Internet Security that provides both firewall and antivirus protection.

Trading places

Ironically, it has been a general move away from the banking system by people looking for a better return on their savings that is introducing many people to Internet financial transactions. Australia is now the largest shareholding nation per head of population in the world. It is estimated that about 20 per cent of all share trades are now done online, and the numbers are growing. Most banks have been forced to offer Internet share trading facilities.

The major banks are now offering share trading accounts for as little as $12 a trade, or about 10 per cent of the average trading fee; however, the average is closer to $25. The banks offer a full share service complete with the latest news, share prices and charts so investors have up-to-the-minute information on which to base their buy or sell orders. The service is gradually being offered on WAP mobile phones and is expected to be one of the most common forms of m-commerce over the next 12 months.

The Big Four and merchant banks such as Macquarie (**www.macquarie.com.au**) have offered investment services for many years, and several of the smaller banks and building societies are now forming alliances with broking houses so they can compete online.

Taxing time

Being able to keep track of all banking and trading transactions online will benefit anybody who has to make regular tax payments under the new Goods and Services Tax and pay-as-you-go tax reforms.

While electronic lodgement of tax returns has been available for several years, it has usually been done through Post Offices or tax agents using special software and direct modem links. You can make direct credit payments to the Australian Taxation Office (**www.ato.gov.au**) from your computer, but this requires special software. According to the ATO, you will need a desktop computer banking software package. Most packages transfer funds using the banking industry's Direct Entry System (DES), although some offer the option of payment by Real Time Gross Settlement (RTGS). Payments by DES are preferred by the ATO.

That is too much trouble for many people. The ATO has promised to make things simpler in time for the introduction of GST.

The new tax reforms will generally simplify the tax system, but they also will mean that millions of Australian will have to make several payments a year to the ATO rather than just one or two. If that is left to an accountant or other tax professional, it is going increase costs for many individuals and businesses. However, the solution could be as simple as BPAY. The ATO is trialling a BPAY system that will allow people to pay their tax bills online, including their GST. It is expected to be available in time for the introduction of the new tax from 1 July.

It took several years for people to get used to the idea of automatic teller machines, but today 90 per cent of bank customers use them. Telephone banking also is widely accepted as we move away from over-the-counter transactions, so it is not hard to predict that Internet banking will gain similar acceptance.

By the end of last year, 530,000 people were using online banking, 150 per cent more than at the beginning of the year. By the end of this year, almost 1,500,000 are expected to be controlling their money online, either through an Internet-connected computer or a WAP-enabled mobile phone. Those who do will pay about one-fifth the bank fees and charges incurred by traditional methods, and for many that is incentive enough. ■

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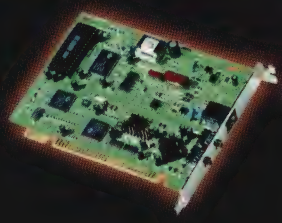

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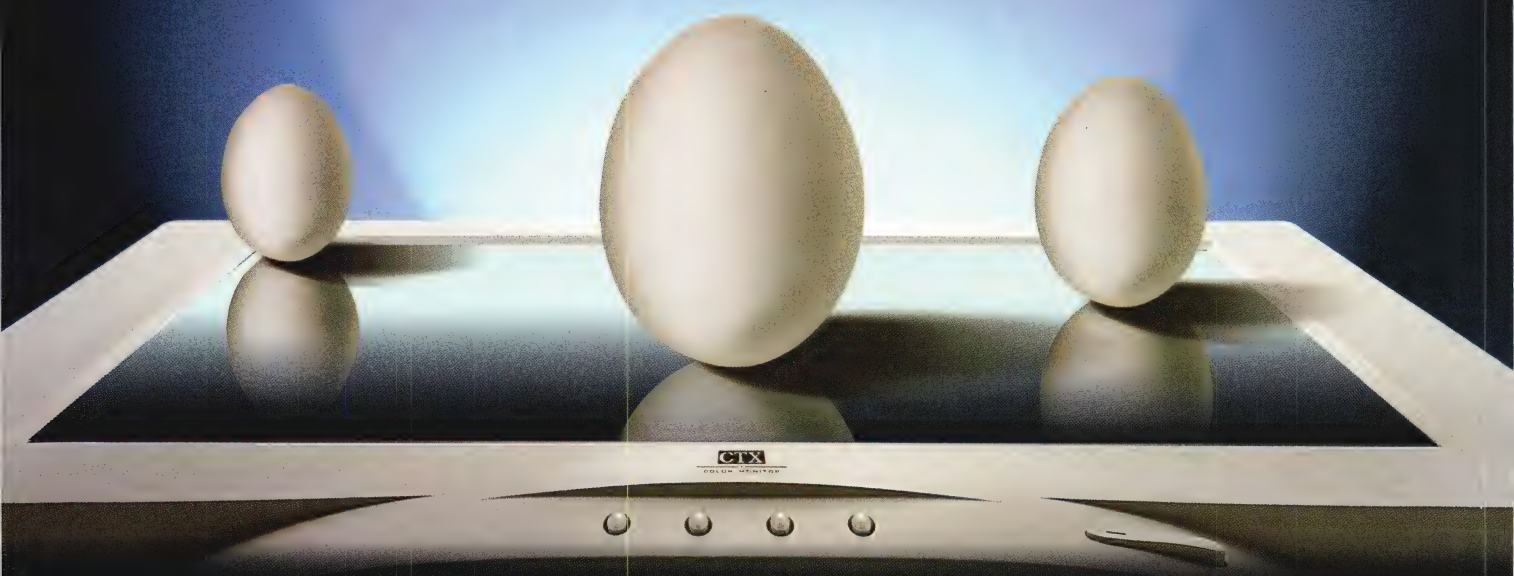

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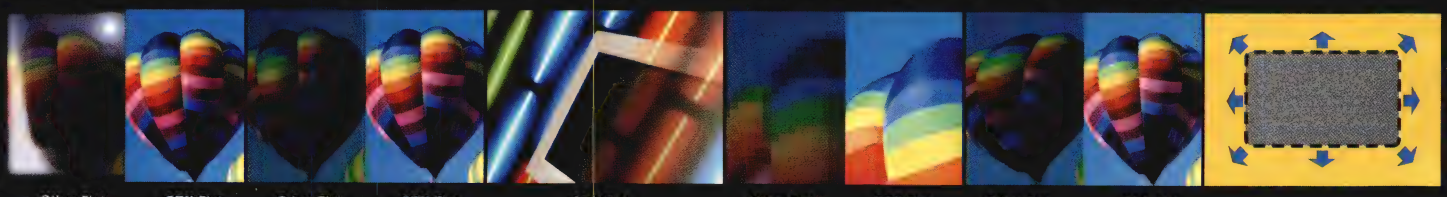

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BY PHIL CAMPBELL

PERSONAL DIGITAL ASSISTANTS HAVE GONE FROM GEEKY GADGETS TO PROFESSIONAL POWER TOYS (EVEN THE PM SPORTS ONE). WITH THE LATESTPERFORMANCE IMPROVEMENTS, SOME NEW HUES, AS WELL AS PRICING TO SUIT A RANGE OF BUDGETS – NOW'S THE TIMETO CHECK OUT THE HOTTEST HANDHELDS.

If there are two words that describe the handheld computer market in the last 12 months, they are "ubiquity" and "shake-out". These days, there won't be so many raised eyebrows when you pull a PDA from your pocket, and you won't feel quite so geeky taking electronic notes at a meeting. In fact, it's more than likely you'll be beaming infrared comments to colleagues across the room. Even our Prime Minister is on board — at a cost of a mere half million dollars, the whole federal cabinet is now coordinated through a central database with links to a platoon of Palm organisers.

Visit the Palm Computing Web site (**www.palm.com**) and you'll see the claim that over six million Palm Personal Digital Assistants have now been sold. More importantly, there are reportedly 50,000 developers creating software for the Palm operating system — there's a Palm application for almost everything. Hence the shake-out. As the Palm dominion grows, with a broadened range and lower prices, other players scatter.

Since PC World surveyed the PDA market this time last year, devices like the Royal DaVinci, which promised Palm-like performance at a low-end price, have disappeared locally. Many Windows CE-based devices have followed suit — we looked at the Philips NINO Handheld, longer available here. Casio is "between models", and only Hewlett-Packard's Jornada and Compaq's Aero are pressing ahead (at press time, HP was unable to supply a review product for this round-up). The new version of Windows CE, rebadged as Pocket PC, has just been released — the lure of MP3 audio and multimedia may make a mark, especially teamed with hardware like Compaq's upcoming handheld iPAQ.

In another corner, Psion's Series 5 and Revo handhelds continue to carve their own market niche, having forged a strong alliance with Ericsson. If mobile phone and data convergence is as significant as these guys are claiming, it could be a marriage made in heaven. So far, though, there's more talk than action.

This has also been the year of PDA add-ons. Look in the right places and you'll find industrial strength barcode readers and card-scanners for CE devices. Look almost anywhere else, and you'll find Palm-oriented gadgets like the PocketMail acoustic coupler, Kodak's PalmPix camera attachment, and Palm's own incredible fold-out keyboard, plus a variety of third-party covers, screen protectors and cases.

So far, the PDA message has been that "small and tight" beats "big and bright." The practicalities of carrying and using a personal digital assistant mean usability and ergonomics are dominant factors. That's unlikely to change. Read on for a hands-on survey of the new millennium's hottest PDAs.

PALM – DOING IT IN COLOUR

Most products would never survive the labelling fiasco that has dogged the Palm product family through its short history. First it was the US Robotics Pilot — then, after litigation from the Pilot pen company, a PalmPilot. Now it's just plain "Palm". Model numbering is just as obtuse — so while the IIIe sits at the bottom of the range, and the V occupies the executive mid-range, it's back to IIIc for the top-of-the-line colour system.

For long-time Palm users like me, there's something quite uncanny about the IIIc colour screen. Spine tingling almost. That crisp mono we've grown to know and love hasn't been just superseded — it's been totally outclassed. In short, 3Com has done its homework, and done it well. The Palm IIIc is slightly longer than the entry-level IIIe, and a tad heavier. The extra 15g make a surprisingly noticeable difference as the unit sits in a trouser pocket, which at first made me less than enthusiastic about day-to-day usability. Trust me — minor ergonomic issues like these can make all the difference to whether your PDA is a friend or a foe.

But, I've been seduced. In use, the colour-enabled IIIc is a delight. So far, changes in the address book, memo and calendar apps have been insignificant — colour-coded appointments and contacts should be a priority in future updates. But as soon as you see your favourite family photo in full colour in an Album-to-Go slideshow, you'll be hooked. Emotional blackmail, maybe, but the active matrix TFT display is crisp, clear and precise, with surprisingly good detail on a 160x160 pixel screen. Still not convinced? Download Zap!2000, a vertically scrolling

shoot-em-up that outclasses anything a handheld game machine can offer. Three-level parallax scrolling, a deep-black space background, smooth sprite animation — you'll hardly believe it's happening on a simple Palm PDA. Sorry. Forgot. This is a serious business tool. But, hey, if you have a few spare minutes while you're waiting for that meeting . . .

Palm IIIc
Dimensions: 80x15x128mm
Weight: 185g
Memory: 8MB
Processor: DragonBall 20MHz
Screen: 160x160 TFT colour
Power: Rechargeable Lithium-Ion
Price: $899
Phone: 1300 360 558
URL: www.palm.com.au

Like the Vx, the IIIc boasts 8MB of memory, and a rechargeable Lithium-Ion battery pack. A few minutes each day in the hot-sync cradle is enough to keep the battery fully charged. While driving the TFT screen halves between-charge battery life from four weeks to around two, under normal hot-sync and recharging conditions, most users won't notice the difference.

Aesthetically, the IIIc is appealing — the jet-black flip-front case replaces the older charcoal model. It lacks the obvious chic of the brushed aluminium V series, but you'll still feel quite at home in the executive suite or the Qantas Club lounge.

Sadly, the whole Palm series remains weak in the audio department. Alarms are still too soft to be heard in a noisy environment, and there's no answer to the upcoming promise of CD quality MP3 audio in the new version of Windows CE.

One final subjective note — somehow, there seems to be just a little added friction on the Palm's graffiti-text input area. Entering text with the well-balanced gunmetal stylus is just a little more pleasant as a result.

POWER WITH STYLE

The release of the original Palm V somehow signalled a new phase for the PDA market. The ultra-slim, wedge-shaped aluminium case with designer leather cover-flap announced that Palm technology was ready for the mainstream. And, apparently, a large market segment was happy to pay the price. This was a device that could sit happily in the pockets of Managing Directors and Prime Ministers — even if they weren't quite sure what it could do. On the downside, the Palm V was limited to a strictly non-expandable 2MB of RAM. The new Palm Vx offers the best of both worlds — a heavy-duty 8MB memory chip, with the same slim-line aesthetics. That's enough storage space for an estimated 10,000 address book entries, 3000 to-do items, 3000 appointments, 3000 memos, and 400 e-mail messages, with room to spare for plenty of add-on applications.

The Palm Vx ships with the standard PC-end Palm Desktop application — well overdue for a major cosmetic overhaul in line with the aesthetics of the handheld unit. Datebook, Address book, Expense and memo pad data hot-syncs directly to the desktop app, while conduit software is provided to link directly with Microsoft Outlook as well — clearly the preferred route for most users.

Like the IIIc, the Palm Vx features the latest Palm 3.5 operating system, with faster synchronisation, improved "tappable" menu-access — no need to hunt for the menu button at the bottom of the screen — improved privacy features, and a useful Agenda view. Infrared support has been improved, too, with a full IR hot sync option now available.

Sadly, high-end Palm shoppers are faced with an unenviable choice . . . colour screen, or sexy slimline case? If you're buying for an enterprise, my advice is stick with the mono Vx — all the productivity, without the seduction of colour IIIc games.

Palm Vx
Dimensions: 77x10x115mm
Weight: 115g
Memory 8MB
Processor: DragonBall 16MHz
Screen: 160x160 reverse backlit mono
Power: Rechargeable Lithium-Ion
Price: $799
Phone: 1300 360 558
URL: www.palm.com.au

PALM FOR EVERYONE

At a price-point hovering right around the $300 mark — often discounted — the low-end Palm IIIe is worthy of particular mention. Sure, it's lacking some of the grunt you'll get for an extra fistful of dollars, but, for most users, the see-through plastic-cased IIIe is the perfect entry point. The unexpandable 2MB capacity means you'll be limited to 6000 addresses, 3000 appointments and 1500 memos and to-do items — but that's more friends than most of us make in a lifetime.

The IIIe brings to mind another fundamental law of PDAs — for most of us, there's a certain limit to the value of a gadget you're prepared to carry in your pocket. Somehow, too, for an "information device", the value of the hardware should be less than the notional value of the information you're storing. For average users, the

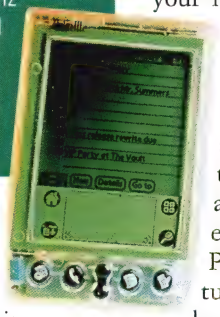
Your mobile phone as PDA . . . now

If you're mainly looking for a PDA to store common phone numbers and remind you of appointments, you may find your current mobile phone is all you need. Phone numbers are easy — you've programmed them into memory already. So what about appointment reminders? They're easy, too, when you sign up with Byedesk.com, a Web-based service that redirects e-mail messages to your mobile phone via SMS.

Here's the trick. When you've been allocated a byedesk address (like philcampbell@byedesk.com), sign up with a Web-based reminder service like Yahoo Calendar. Enter your byedesk address in the e-mail reminder field, and your appointment details will turn up right on time as text messages on the screen of your mobile phone. PDA convenience wherever you go.

Palm IIIe

Dimensions 80x15x120mm
Weight: 170g
Memory 2MB
Processor: Dragon Ball 16MHz
Screen: Mono 160x160 pixel
Power: 2xAAA batteries
Price: $349
Phone: 1300 360 558
URL: www.palm.com.au



IIIe wins on both counts — the world of Palm functionality, at an easily justifiable cost. And the see-through case is really very hip.

EUROPEAN ELEGANCE

In an increasingly aesthetics-driven market, there's no doubt the Psion Revo looks very good. The slimline silver and blue case is nicely contoured, and opens smoothly, without the complexities of the Series 5 butterfly mechanism. Though much slimmer and lighter than Psion's Series 5 machines, the Revo is still too long for a shirt pocket, and too broad for a belt-clip. It's hand luggage, about the size of a purse — a comparison made more obvious by the inclusion of a suede leather pouch.

The mono screen is businesslike and crisp — though you'll always need the backlight — and the built-in rechargeable batteries run for weeks between drinks. The Revo carries a trimmed suite of EPOC software applications. While the Series 5 software suite seems to have processing power to spare, the Jotter, Agenda and Contact programs are aimed at lightweight PDA-style tasks. The more powerful Word and Data apps are still on board, but buried under another level of menus.

PSION REVO

Dimensions: 150x80x15mm clamshell
Memory: 8MB
Processor: 36MHz ARM 710 running EPOC O/S
Screen: 480x160 greyscale (16 shades)
Price: $799
Distributor: Vodaphone
Phone: (02) 9425 7777
URL: www.psion.com

The Revo is designed to sync with your infrared-enabled mobile phone, provided it comes from Symbian alliance partners Nokia, Siemens, Motorola or Ericsson. E-mail and SMS messages can be sent directly from the Revo through your phone, and all your Revo data syncs easily with your PC through PsiWin3.1 software. Worst feature? Definitely the tight little keyboard. This is not a machine designed for heavy duty text editing. Priced at around $799, the Revo's practical appeal is limited, unless mobile phone connectivity is high on your priority list.

LIGHTWEIGHT CE

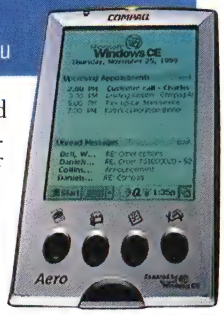
Here's a dash of irony. Just as Palm discovers colour, Compaq's Aero 1520 is touting the benefits of a back-to-basics mono screen. And benefits there are — at least in comparison with the fat and heavy Series 2100. Running Windows CE on the crisp mono screen, the Aero has a businesslike air. Who needs gaudy colours, anyway? The businesslike look and feel continues to the casing — rectangular, with a matte-silver faceplate only slightly mitigating an overall sense of plastic.

Apart from the obvious benefits of the sub-Palm III size and weight, you'll find the Aero 1520 offers some neat features. A series of side-mounted buttons offers easy access to dictaphone-style audio recording, and easy navigation through applications with the thumb-operated toggle button. A Compact Flash slot offers space for extra add-on data storage, and easy transfer of files between the unit and, say, a digital camera or PC-mounted card reader.

In use, the Aero 1520 comes with all the strengths and weaknesses of the current iteration of Windows CE. On the positive side, there's almost seamless integration with your favourite desktop applications — just drag and drop files between your key Microsoft apps and your handheld for easy portability. Outlook appointments are instantly synchronised with no fuss or bother. And — in theory at least — if you already know your way around Windows, you'll know your way around your handheld device. So much for theory. I find that the mire of overlapping menus and dialogue boxes on a small handheld screen are thoroughly confusing. Adding to the confusion is the usual start menu metaphor; the thing I can't find is the desktop — you're always inside an application, and the only way out seems to be to start another one. Urk.

Compaq AERO 1520

Dimensions: 128x78x13mm
Weight: 147g
Memory: 16MB
Processor: 70 MHz MIPs
Screen: 240x320 backlit mono, 16 grey shades
Battery: Lithium-Ion, 14 hours use
Price: $699
Phone: 1300 368 369
URL: www.compaq.com.au

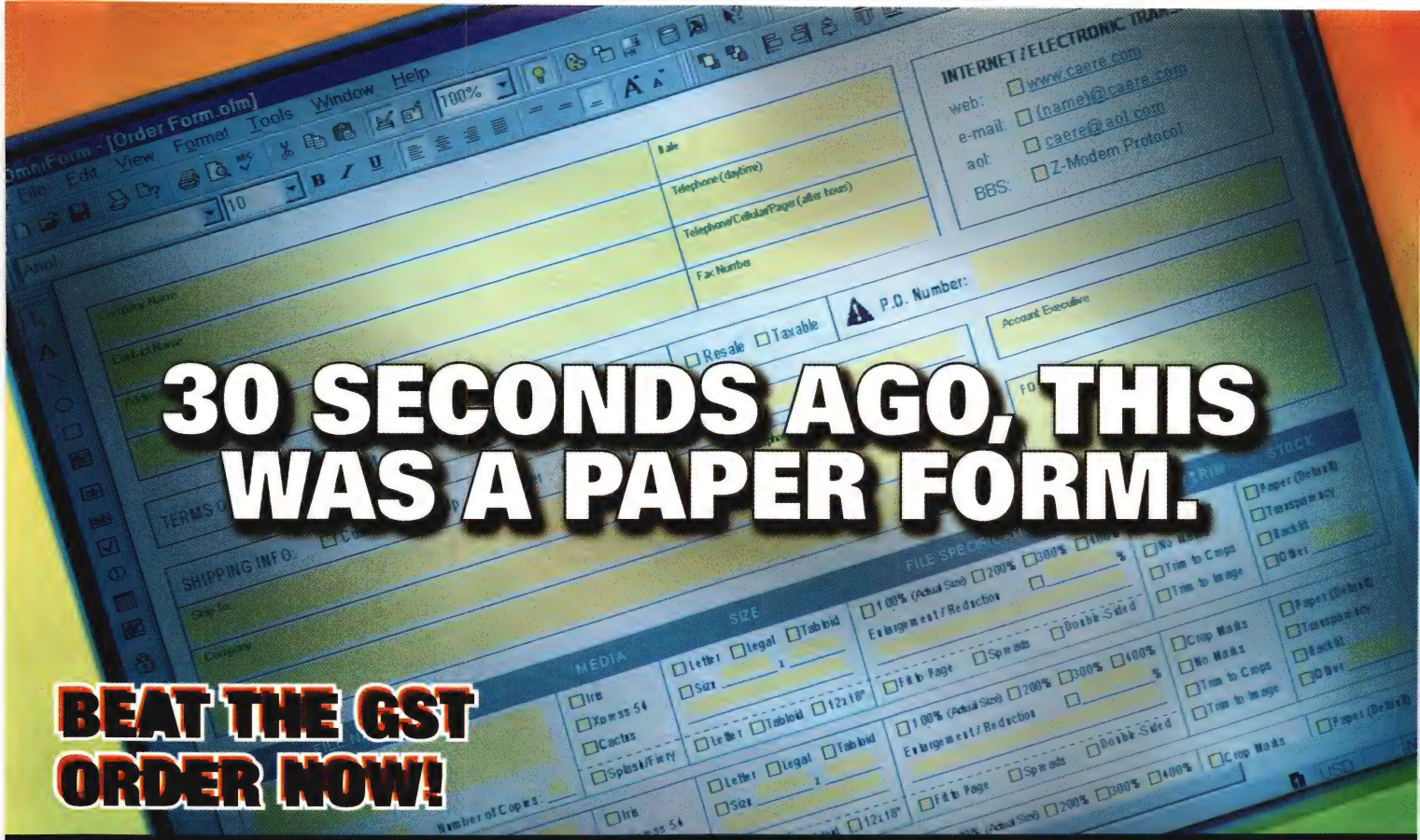


Compaq offers some useful extra software with the unit. Audible Player is an impressive tool — there's a huge range of downloadable audio books and resource material available online, and sound quality through the Aero's stereo headphone jack is impressive. Finally, if you're already an Aero 1520 user, you'll be glad to know there's an easy upgrade path to the new version of Windows CE — see details over page.

NEW AND FRESH

COMPAQ'S IPAQ

"Houston, we have lift-off" took on a whole new spin when samples of Compaq's brand new hardware were stolen between Houston Head Office and the Australian media launch. Apart from leaving a significant hole in



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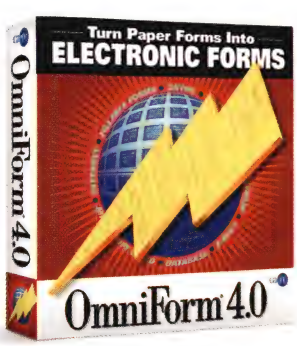

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proceedings, the expensive baggage-loss means we were not able to test the pre-release version of the new Pocket PC-powered iPAQ "portable Internet appliance" — nor to go "hands-on" with the long-awaited Bluetooth wireless interface. The only new gear that made it was one Bluetooth-enabled mobile phone, which on its own was as useful as one hand clapping. So imagine, if you will, a world of transparent high-speed radio-beam hot-syncs, automatic connectivity, and gleaming Star Wars-styled handhelds. We had to imagine it, too — with a little help from a slick PowerPoint presentation.

With Microsoft keen to make a splash with its relaunched Windows CE — now going under the Pocket PC banner — Compaq's new iPAQ handheld looks like the perfect hardware partner for the job. Built around a powerful 206MHz Strong Arm processor with 32MB of RAM, the iPAQ shares the successful form factor of the Aero 1520, though in a restyled, sculptured case. With colour screen and the ability to play standard MP3 audio files, the specs look impressive. The new Pocket PC operating system features a stripped-down Windows CE kernel with improved memory management, a rapid search function for instant access to contact data, and improved Outlook integration. Pocket Word, Excel and Internet Explorer are all upgraded, with the promise of simpler, more intuitive operation under the new Windows CE. We'll reserve judgement.

The secret of the iPAQ's compact design lies in what's left out of the base module. This is a PDA that needs to be "dressed up" with a choice of functional clip-on "jackets". Choose the fashionable "leather jacket" for simple protection, or add a PC-card jacket, a Compact Flash jacket, or a Bluetooth jacket. These clip on around the iPaq, adding whatever function you need. Other neat features include an ambient light sensor, which adjusts the display contrast automatically. The first iPAQ units should be available as this issue goes to press. Meanwhile, current Aero users can step up to the Pocket PC operating system with a simple plug-in upgrade. Contact Compaq for details. ■

Gadgets and Gizmos

PALM PORTABLE KEYBOARD

While much of the Palm's geek-appeal comes from the Graffiti handwriting input system, there are times when you just can't beat a good old-fashioned keyboard. When that time comes, the Palm Portable keyboard is ready and waiting. Folding down to an easily pocketable package measuring just 93x130x20mm, this origami marvel blossoms into a full-sized keyboard with the same 19mm key pitch and 3mm travel as most laptops. The feel is precise and positive, and touch-typing is a breeze.

Hooking up is easy. Simply feed the driver software into your Palm, attach it to the hot-sync style connector at the back of the keyboard, and you're ready to type. The main Palm control buttons are duplicated on the keyboard for easy access, and the text you type appears instantly on the screen.

Folded, the gunmetal-grey casing of the keyboard matches the Palm V nicely. Admittedly, in use the whole arrangement looks a little odd — a laptop with the smallest screen in the world. And you'll need a stable surface to work on, as the centre-hinged underside remains a little floppy. Forgive the foibles — the Palm Portable Keyboard is a work of genius, opening up a world of serious text entry applications to anyone with a little extra pocket space. Highly desirable.

Price: $200
URL: www.palm.com.au

KODAK PALMPIX
CLIP ON A CAMERA

While everyone else has decided megapixel resolution is essential for serious digital imaging, Kodak has released the PalmPix — a stubby lens attachment that clips onto the base of your Palm III and feeds in low-res digital images. Yes, it's definitely clever: your Palm III provides all the buttons to operate the shutter, and the screen becomes a large, live-action viewfinder. And yes, if you're using a colour Palm IIIc, the images are in glorious technicolour. Except, sadly, they're not all that glorious. With a resolution of just 640x480 pixels, the images I've grabbed have been grainy and lack colour saturation. As there's no built-in flash, lighting conditions have to be perfect for a successful shot. The camera features 2x digital zoom, a focal range of 1m to infinity, a 10-second self-timer, and shutter speeds of 1/15 to 1/500 seconds. Images are stored on the Palm in the common JPG format but unfortunately can't be accessed by other Palm programs without syncing back through the host PC. Overall, a neat gadget — but certainly not a replacement for a good quality digital camera like Kodak's DC215.

Price: $349
URL: www.kodak.com/go/palmpix

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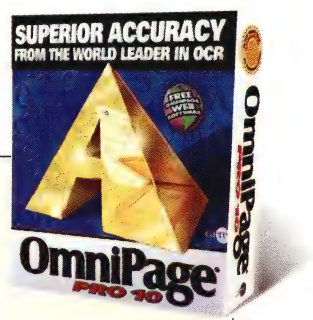

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caere

BY MATTHEW NEWTON

Is Linux right for you?

LAST YEAR WAS ONE BIG COMING-OUT PARTY FOR LINUX. Attended by the buzz worthy of a Microsoft product launch, this Unix-like operating system arrived on the computing scene as the Next Big Thing. Existing Linux companies made plans to go public, new Linux companies sprang up like lemonade stands during a heat wave, and companies that had never heard of the OS stumbled over themselves to adopt a "Linux strategy" (and watch their stocks rise). Major Windows-only computer vendors such as Dell and IBM started offering server and desktop equipment with "Linux inside".

For Windows users, the Linux hype raises many questions.

Is Linux just another computing fad soon to disappear from the headlines, like push technology? Or is it here to stay, like the Web? Not only is it here to stay, but the number of people using it at the corporate and desktop levels continues to mushroom.

What makes Linux so special compared with other OSs? The answer is that it's inexpensive to install and maintain, resists crashes better, and can run on numerous platforms — from Intel-based PCs and Apple Macintoshes to high-end Sun servers.

Could Linux become a realistic alternative to your Windows desktop? Perhaps — and sooner than you may think. Dell Computer will install Linux on servers, workstations or other machines if a customer requests it. Compaq offers RedHat Linux 6.2 on its servers, Alpha stations and select Deskpro PC models. And Corel is making desktop Linux a more palpable reality with no-sweat installation, a user-friendly desktop, and the promise of a tool that will let you use Windows applications (if your PC is set up in a networked environment).

If you love something, set it free

From all the hype, you probably know that Linux is open-source software — which means that Linux users can download, test, use, alter and copy it as much as they want. Among its benefits, open-source software is supposedly more stable than proprietary, or closed-source, software. The reason is simple: peer review. When something goes wrong with open-source software, any programmer can go "under the bonnet", analyse what's wrong, and offer solutions for all users.

Windows users will find the willingness of the open-source community to respond to bug reports downright astonishing. For instance, when I found a bug in a third-party Linux ICQ client, I e-mailed the author about it, and — voilà! A new, corrected version appeared within 48 hours.

Like the Internet, Linux isn't controlled by a single company. Linus Torvalds created the "kernel" — the core of the alternative operating system — in 1991 while he was still a student at the University of Helsinki, and he chose to make it available to everyone. Developers are free to change the kernel source code for their own purposes, but all of the modifications they introduce must be made public, and many are submitted to Torvalds for incorporation in later versions of the kernel.

Torvalds himself works for a company that doesn't even produce a version (or distribution) of Linux for PCs. Instead, that job has fallen to such firms as Caldera, Corel, Debian, TurboLinux and RedHat. Each of these companies adds its own embellishments to the Linux kernel — a unique graphical user interface (GUI), various applications and applets, a customised setup program, system utilities that keep everything running smoothly, etc. As a result, distributions of Linux differ.

Although anyone can download the latest kernel for free, Linux distributors generally charge for their particular add-ons and technical support (see "Pick Your Flavour of Linux," page 72).

People who've adopted the OS — from staff members of corporate IT departments to end users — say Linux is a stable operating system that rarely crashes. That news surely gives pause to companies considering an upgrade to Windows 2000.

Frohwitter, an international patent attorney firm (based in the US), had considered upgrading its network operating system from Windows NT to Windows 2000 but opted for Linux instead.

"We wanted Linux for its stability and also to preclude the need to upgrade to Windows 2000," notes Ronald Chichester, a lawyer with the firm. "One of our staff attorneys ... discovered that Windows NT crashed up to three times per day. But now that we run NT on top of Linux, her computer has not crashed in weeks."

Like most businesses, Frohwitter depends on an array of Windows-based applications and didn't want to lose access to them. By using VMware's $US299 VMware for Linux ($US99 for individual, non-business users), the firm can get the stability of Linux while still using Windows apps. Corel will be adding similar functionality to its Corel Linux OS, thereby enabling users to access and display Windows applications running on networked servers. Although Linux currently enjoys a 25 per cent share of the server market, it commands only 4 per cent of desktop operating systems sold, according to figures provided to International Data Corporation.

Corel, which is probably best known for desktop PC apps such as CorelDRAW and WordPerfect Office, is banking on the anticipated Linux juggernaut. The company is reorganising itself and has merged with software giant Inprise/Borland in an attempt to become a Linux powerhouse. According to Derik Belair, director of strategic applications for Corel, Linux's stability and versatility are its central strengths. "Linux can power a handheld device or run a cluster of very powerful machines. And [because the architecture is open] we can make all these devices talk to each other," says Belair.

Other Linux developers share Belair's opinion. Bob Young, the chairman of Linux distributor RedHat, notes that the operating system is ideal for thin-clients (for example, PCs used exclusively to run a Web browser) and for Internet-connected appliances such as the RedHat Linux-based TiVo set-top box for television. Even Royal — a business machine maker since the half-forgotten days of the manual typewriter — is porting Linux to its line of low-cost DaVinci handheld personal organisers.

THINGS YOU SHOULD KNOW BEFORE YOU INSTALL

Each distribution has a totally different setup routine. We aren't talking apples and oranges here — more like apples and Orcas. Way different. Accordingly, here are a few precautions:

GET THE HARDWARE LOW-DOWN

Before you commit to a particular Linux distribution, check the vendor's Web site for a hardware compatibility list. Make sure all of the peripherals and components you need to use are listed. If one is not listed, check to see whether another distribution supports it. If you already have Windows running on the PC on which you would like to install Linux, go into the Device Manager (right-click *My Computer*, click the *Device Manager* tab, and click the *Print* button). Choose to print out "All devices and system summary". This data can be useful if your distribution's setup program asks for specific information about your hardware.

FREE — ALMOST

If you have a high-bandwidth connection and don't think you'll need tech support, you can download many Linux distributions directly from the vendor and use a CD-R or CD-RW drive to burn a setup disc. If that's not an option but you'd still like to save some cash, online resellers like Linux System Labs (**www.lsl.com**) will sell you copies of certain distributions (including Mandrake and RedHat) for less than $US10. Of course, at that price, the OS comes with neither support nor bundled extras.

TEST THE WATERS

If you have an extra PC with no critical programs or data on it, you might want to use it as your Linux guinea pig.

KNOW YOUR RESOURCE NEEDS FIRST

Make sure you have enough hard disk space, RAM, and CPU speed to accommodate and handle a Linux install — either on its own or in separate hard disk partitions on your Windows PC. Check the Linux distribution you plan to install, and ascertain its hardware resource requirements; then see what your PC has available.

SCARE UP A SPARE FLOPPY

Most distributions will prompt you to create a rescue disk installation. Have a blank floppy ready so you won't have to skip this important step.

SAFETY FIRST

Installing a new OS is no walk in the park for your hard drive. To be on the safe side, back up all your important data on removable media before beginning the Linux installation.

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Linux inside?

Is your computer ready for Linux? Until now, a notoriously frustrating installation process has stopped most people from loading Linux on their desktops and notebooks. Corel has remedied this problem by introducing a simple four-step setup. Corel Linux also includes a copy of WordPerfect 8 for Linux that can read and save documents in Microsoft Word and other common formats.

Hardware compatibility, especially for printers, has posed another obstacle to using Linux on your PC. Hardware vendors have been slow to offer driver support, but in response to the massive growth of the Linux user base, peripheral makers have begun to come up with the necessary drivers. "Now that we have the public support of the major PC vendors," says RedHat's Bob Young, "they are putting pressure on their suppliers to ensure that the components they use support Linux."

ATI, 3dfx, S3 and a number of other major video graphics card producers now accommodate Linux and cooperate with the open-source community to make drivers available. The upcoming Linux kernel release 2.4 will bring USB and IEEE 1394 (FireWire) support to Linux, and Corel has been spearheading an effort to standardise Linux's printer support.

The final roadblock facing Linux has been the lack of popular software that will run on it. The absence of Linux versions of big-time business and personal applications like Microsoft Office, Adobe Photoshop, and Intuit Quicken still hampers the OS, but PC users no longer have to choose between running Linux and using their favourite apps. Third-party solutions — notably VMware and GraphOn's Bridges — let Linux PCs run Windows 9x and NT software.

Looking for the killer app

Linux advocates expect the software situation to improve soon. Corel is investing not only in its own distribution of Linux, but in a Linux version of its massive Windows-based WordPerfect Office suite, which includes the Quattro Pro spreadsheet, the Paradox database, Corel Presentations, and Corel Central (a personal information manager). So far, WordPerfect Office is the only major business-oriented application suite to cross the Windows/Linux divide. However, other applications such as StarOffice (reviewed page 109) now run on Windows as well as Linux.

Will the advance stop at Corel? Analysts believe that further Linux versions of popular Windows apps are unlikely unless someone develops a killer app to get desktop adoption of Linux rolling on a Windows-imperilling scale. (A killer app is a program with such outstanding benefits that its underlying technology — say, Linux — is worth adopting.) Certainly, a lot of techies and tech visionaries feel a strong affinity for Linux. That's why Tony Iams, a senior analyst with D. H. Brown Associates, says he wouldn't be shocked by the emergence of a Linux-based killer app. "In fact," he says, "[such development] could be happening in some garage right now."

In light of Linux's impressive progress over the past six months, the

PICK YOUR FLAVOUR OF LINUX

DISTRIBUTION	PRICE	COMMENTS
Caldera OpenLinux 2.4 www.caldera.com.au	$89	Caldera prides itself on easy installation (you can play a game of Tetris as the OS installs); it focuses mainly on business users.
Corel Linux OS 1.0 linux.corel.com	$79 (standard edition)	The new kid on the block, the 1.0 release has a few rough edges but is the easiest, friendliest Linux yet.
Debian GNU/Linux 2.1 www.debian.org	$49	Corel built on this distribution to create its own product. Debian does not yet market its distribution directly, but you can grab a CD from online resellers. No support is included.
Linux Mandrake 7.0 www.mandrake.com	$79 (PowerPack edition)	Originally an offshoot of the RedHat distribution, Mandrake now has a comprehensive Linux installation program.
RedHat Linux 6.2 www.redhat.com.au	$70 $150 (Deluxe) $300 (Professional)	One of the oldest, most trusted distributions around, RedHat has long been considered by many Linux veterans to be the best distribution for Linux servers.
Slackware Linux 7 www.slackware.com	$59	The granddaddy of Linux distributions – think of it as a "by hackers, for hackers" offering. Walnut Creek CD-ROM distributes and markets Slackware.
SuSE Linux 6.3 www.suse.com	$90	This German distribution is popular in Europe. It sets itself apart from the rest of the pack by shipping with hundreds of applications.
TurboLinux Workstation 6.0 www.turbolinux.com	$49	The most popular distribution in Asia, TurboLinux is gaining support in the West among IT professionals who tie many PCs together to act as one powerful computer (a technique know as clustering).

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hyperion series

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choice between Windows and Linux has become a lot more difficult to make. To simplify the situation, we've formulated several questions you should ask yourself before deciding whether to make the jump or stand pat.

Your Linux questions answered

CAN I PUT LINUX ON MY PC?

A Of course. But getting it to work properly might take some work — or even require that you replace hardware. As noted earlier, one long-time problem with Linux has been its hardware support. For instance, you might have trouble making graphics hardware work under Linux, because vendors only recently began working with the open-source community to provide drivers for Linux's graphical user interface, XFree86. This situation is steadily improving: the latest release of XFree86 provides support for NVIDIA's entire line of graphics accelerators — including the GeForce 256 — plus new adapters from S3, ATI, 3dfx and others.

Modems are another source of trouble, although any external modem and many internal ones will work with Linux. Problems arise with devices called Winmodems. They work like regular modems (and are sold as full-fledged units), but Winmodems rely on your computer's CPU to handle much of the processing that standard modems do themselves. This makes them cheaper but also leads to conflicts with Linux, since the software that makes the magic happen runs exclusively under Windows. Modem manufacturers, fearing support troubles and being reluctant to give away their secrets, have not provided open-source developers with enough technical information to create third-party Winmodem drivers. These widely distributed devices are, for the moment, useless under Linux.

Previously, built-in printer support for Linux was minimal. Most current Linux applications produce output in PostScript — a page layout that only expensive, high-end printers tend to support. A utility called Ghostscript lets these apps talk to non-PostScript printers, but Ghostscript drivers can't support the entire range of printers. (In addition, some apps provide their own set of printer drivers.) The bottom line: if your printer is a few years old or a high-end model, you have a better chance of being able to make it work. The printing situation should improve significantly over the next year because Corel has open-sourced the printer routines developed for its office suite and Hewlett-Packard says it is developing Linux printers.

THE LINUX ALMANAC – FACTS AND SOFTWARE ON THE WEB

DOCUMENTATION AND SUPPORT	COMMENTS
LinuxCare www.linuxcare.com	The big fish in the Linux support sea. This vast site of forums and knowledge bases is free to browse.
Linux Documentation Project www.linuxdoc.org	With contributions from Linux users worldwide, the LDP house essential how-to documents and other data.
LinuxNewbie www.linuxnewbie.org	Offers simple-to-understand help files geared toward new Linux uers.
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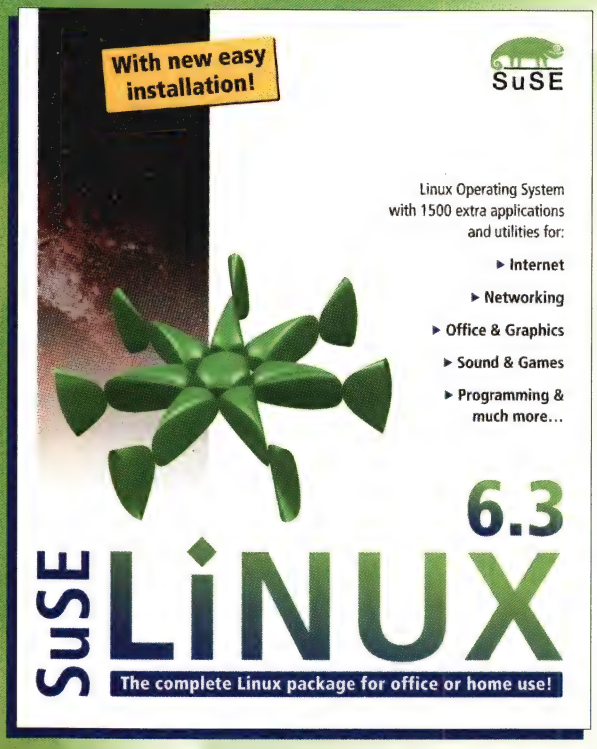

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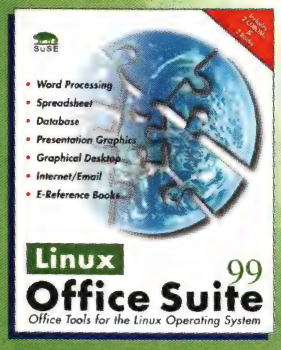

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WILL MY CURRENT HARDWARE SUPPORT LINUX?

A Check with the makers of the various Linux distributions. Most maintain extensive hardware compatibility lists online. For modems, your best online resource is Rob Clark's database page called Winmodems Are Not Modems (**www.o2.net/~gromitkc/winmodem.html**); check here to determine whether your unit is a true modem or a Linux-incompatible impostor. The Printing HowTo Support Database (**www.picante.com/~gtaylor/pht/printer_list.cgi**), a similar database from engineer Grant Taylor, may help you figure out whether your printer will work under Linux. Yet another set of third-party Web pages on the University of Texas Web site (**www.cs.utexas.edu/users/kharker/linux-laptop**) tells you which notebook computers (past and present) will properly run Linux.

CAN LINUX COEXIST WITH WINDOWS?

A Yes. If you want to install Linux but you don't want to jettison Windows from your system altogether, you can arrange to put Linux in a separate area on your hard drive (most distributions need approximately 500MB of space). Whereas Windows uses just one hard-drive partition, Linux generally requires at least two. Some Linux distributions — such as Caldera's — will safely shrink your Windows partition and then create the new partitions for you. Others, however, require you to run a utility like PowerQuest's PartitionMagic first, to get your hard drive ready for Linux. Then, when your machine boots, a tiny program called LILO (the Linux Loader) will let you choose which OS to run. (See Upgrader on page 114.)

If you want to enjoy both the stability of the Linux operating system and the breadth of software available for Windows, VMware's new VMware 2.0 can help: it permits you to run Windows 9x, NT or 2000 on top of Linux — or Linux on top of Windows NT/2000. It accomplishes this by creating a "virtual PC" inside the host operating system — your main OS. You can then install a secondary OS on the virtual machine. The technology isn't perfect, but it works much better than you might expect. GraphOn's Bridges lets Linux boxes use Windows applications, but it works across networks, the Internet, or dial-up and requires a Windows-based server.

I'VE HEARD THAT, UNLIKE WINDOWS, LINUX DOESN'T HAVE A STANDARD GRAPHICAL USER INTERFACE. IS THIS TRUE?

A Yes. But don't get scared. A Windows system's look and feel are determined by the OS itself: Windows defines what menu bars, scroll bars, dialogue boxes and so forth will look like. Linux doesn't provide such definitions — XFree86, the GUI architecture that ships with all Linux distributions, doesn't dictate the look and feel of the interface. Another piece of software, called a window manager, handles that job. The window manager you select (there are many) determines what your on-screen windows, menus and buttons look like, but it may not provide other features, such as a taskbar. Your desktop environment handles that.

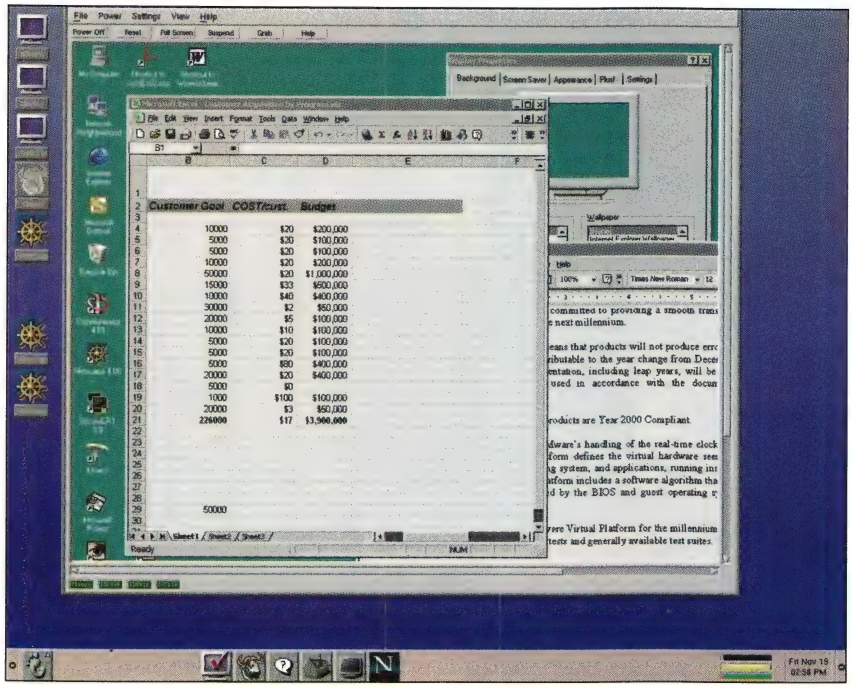
The two main desktop environments currently vying for Linux supremacy are GNOME and KDE. Despite some differences in software architecture, both provide a taskbar, an application launcher resembling the Windows Start menu, and various applets (notepad, calculator, CD player, and so on). Corel Linux OS and Caldera OpenLinux ship with KDE. RedHat Linux and Linux-Mandrake ship with both environments, but RedHat defaults to GNOME whereas Mandrake defaults to KDE.

Neither environment is superior. Both put a clean, straightforward interface on top of Linux — so most Windows users who have never seen Linux before can start to work right after the installation. Both the GNOME and KDE environments are open-source, collaborative efforts, and the development teams for each are striving to build free office applications that will one day be integral parts of their respective environments.

HOW MANY MAJOR APPS ARE AVAILABLE FOR LINUX?

A More than you'd expect, but probably fewer than you would like. The most popular business application suite in the world — Microsoft Office

Put on a happy interface: GNOME (top) and KDE, the leading Linux desktop environments, look much the same as Windows.



You can run Windows apps in Linux by using VMware 2.0, which runs a Windows 9x, NT, or 2000 session on top of Linux, or *vice versa*.

2000 Professional for Windows — is not available, and Microsoft says that it currently has no plans to port Office to Linux. In contrast, Corel has spent more than a year porting its WordPerfect Office suite to Linux, and the finished product is now available. One of the Corel suite's main goals is to achieve interoperability with Microsoft Office.

In some instances where popular apps are unavailable in Linux versions, open-source alternatives are plentiful. So even though Adobe doesn't make a Linux edition of Photoshop, there's an excellent free alternative, The Gimp (**www.gimp.org**). This package matches many of Photoshop's features and has a few extras. Similarly, your digital camera didn't come with Linux software to view its pictures, but download a free copy of gPhoto from **www.gphoto.org**, and you're fully equipped to view your images.

There are hundreds of Linux applications, though most are either highly specialised (like 3D object modellers) or targeted at servers (like robust databases). One exception involves Internet applications. In addition to current versions of Netscape Communicator and Navigator for Linux, there are dozens of e-mail apps, news readers, and more.

IF I INSTALL LINUX, WHAT SORT OF LEARNING CURVE SHOULD I EXPECT?

A That depends on what you'll be doing with it. Performing the installation is the hardest part of becoming a Linux user (though, as we noted, Corel's distribution makes this much easier). Once you've cleared that hurdle, you'll have a very stable, very powerful, Internet-ready operating system at your fingertips. And with the GNOME or KDE desktop environment your Linux distribution sets up, you'll have an easy-to-use, handsome-looking interface that might make your Windows-using friends jealous. On the other hand, there are no drive letters for Linux: in their place is a single, all-encompassing directory structure.

If you use your PC to handle a few core tasks — word processing, e-mail, Web browsing, and so on — you'll probably get used to Linux quickly.

The learning curve looms larger if you undertake bigger projects. Changing your hardware configuration, for instance, will produce some headaches. And if you like to tweak your OS for greater performance or a customised look and behaviour, you'll have a lot of learning to do. In all such operations, don't expect your Windows knowledge to apply.

HOW DO I CHOOSE A DISTRIBUTION?

A Again, that depends on what you'll be doing with your new OS. If you just want to give Linux a spin to see what it's like, Corel Linux OS, Caldera and RedHat are good bets. With its simple installation process and a slick, customised implementation of the KDE desktop, Corel makes Linux easier than ever to set up and use. The package's inclusion of WordPerfect further enhances its appeal. See "Pick Your Flavour of Linux," page 72, for specific information and comments about the major Linux distributions.

LINUX SOUNDS LIKE A REAL MIXED BAG. HOW DO I KNOW WHETHER I SHOULD TRY IT?

A Ask yourself this: is your PC already doing everything you need it to? If the answer is yes, Linux makes little sense in your immediate future. If the answer is no — because you want to run a simple Internet server, say, or because you're sick of "blue screen of death" problems with Windows — then perhaps Linux is worth a look.

As we've noted, some hardware compatibility issues remain, and there is no killer app to justify Linux yet. And though a tonne of software is available, it might not be the software you're looking for. Linux is growing tremendously, but it's still an infant, and infants aren't for everybody. ■

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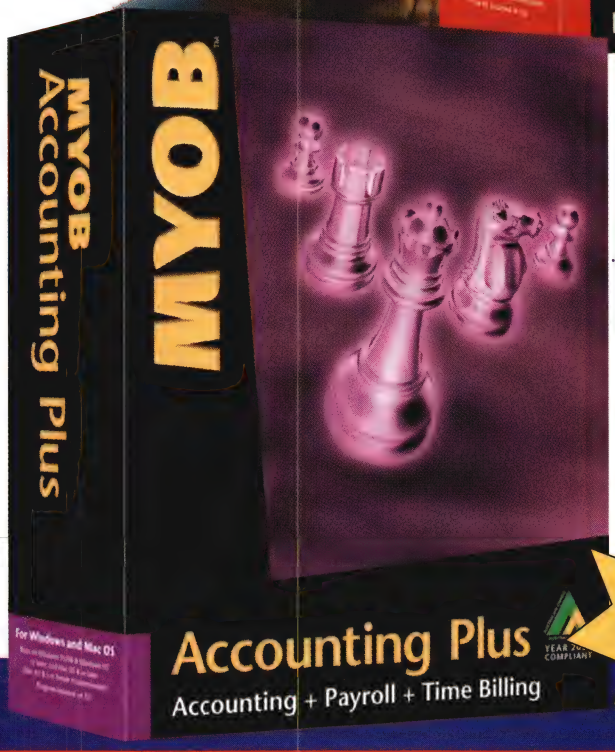

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BY SPIRO HIONIS AND ELIAS PLASTIRAS

Windows2000 performance tests

In this feature we endeavour, via benchmark testing comparisons, to show you how your applications will perform under different configurations if you do decide to use Windows 2000.

To get the most from their Windows 2000 system, people commonly wonder if NTFS is really better than FAT32 on a standalone PC, and query how much RAM they should have. The answer to these issues is almost always — it depends on what programs you are going to run on them.

Different programs will require different computer resources, and particular configurations will favour some applications you are using over others. We used PC WorldBench 2000 and SYSMark 2000 as our benchmarks, both of which are designed to work with Windows 2000. They are ideal because of their reporting capabilities and because they give individual component application scores.

At the time of testing, two very popular CPUs for desktop PCs are the 600MHz AMD Athlon and the 600 MHz Intel Pentium III. They were the basis for our two test platforms, along with 32MB TNT2 graphics adapters and 20GB IDE hard drives. The Intel system is based on a motherboard sporting a BX chip set, while the AMD ran on a motherboard with AMD's IronGate chip set.

Both systems were tested under several memory configurations to see which was most effective and what impact it had on the performance of the systems. They were tested configured with 64MB of PC100 RAM, then 128MB, then 256MB. A clean installation of Windows 2000 was performed on each system, for the first round of 64MB tests, using the FAT32 option during the setup. Both benchmarks were then run on each system along with Video2000 and some Quake III frame rate tests. At the end of the 64MB RAM test, the machines were upgraded to 128MB and the tests repeated. RAM was then upgraded to 256MB and tests were again repeated. The whole process was repeated for NTFS.

In addition to giving an overall performance score, our benchmark applications can be broken into itemised scores for each individual application that runs under the benchmark suites. This allows us to determine which applications benefit from additional memory and which favour NTFS over FAT32 — and, hopefully, to answer some basic questions for many of you.

RESULTS

Within our tests, 22 run-time versions of popular applications as well as a multitasking test and a Windows Media Encoder test were repeated over 12 different configurations to produce the results table. The text below details the AMD and Intel processors at the three different memory settings when running under both NTFS and FAT32. To see how your favourite applications performed under these different configurations, refer to the table.

Basically, our results showed us that Windows 2000 running with 128MB delivers a significant and noticeable performance improvement over 64MB. 256MB was overkill for most applications tested, although it did marginally improve total performance over the 128MB configuration. It also showed us that FAT32 provided better performance than NTFS, as did AMD over Intel. On the other hand, the Intel platforms outperformed the AMD in the Video2000 tests. In the area of stability, fewer crashes occurred on the Intel platforms than on the AMD. The Intel also handled graphics drivers better.

In the FAT32 versus NTFS performance competition, FAT32 was a convincing overall winner in any configuration, although our tests showed that some individual components preferred NTFS over FAT32. When configured with 128MB and 256MB of RAM, the Photoshop 5.5 section of the SYSMark 2000 test recorded scores 2 to 6 per cent better under NTFS than FAT32. Different versions of the same software can also react differently, as exemplified by Netscape Communicator 4.06 in PC WorldBench 2000 and Netscape Communicator 4.61 in SYSMark 2000. Version 4.06 favoured FAT32, while version 4.61 preferred NTFS on the AMD platform to the tune of 8 per cent. The following is a summary for each configuration.

CONFIGURATIONS

INTEL 64MB

In both PC WorldBench 2000 and SYSMark 2000, FAT32 provided approximately 4 per cent overall better

FAT 32

	INTEL					AMD				
	64MB	128MB	%	256MB	%	64MB	128MB	%	256MB	%
PC WorldBench 2000 Score	**129**	**145**	**12**	**150**	**16**	**139**	**155**	**12**	**162**	**17**
Word 97	209	203	3	199	5	197	190	4	186	6
WordPro9	284	275	3	276	4	261	253	3	250	4
Excel 97	300	290	3	287	4	291	281	3	280	4
123 9	739	692	6	699	5	686	601	12	600	14
Access 97	509	495	3	494	3	506	482	5	477	6
Powerpoint 97	261	250	4	244	7	251	237	6	233	7
Communicator 4.06	114	110	4	91	20	111	98	12	83	25
Quicken Deluxe 99	854	847	1	847	1	844	831	2	829	2
Photoshop 5.0	533	412	23	393	26	474	403	15	392	17
PhotoPaint 8	708	364	49	344	51	548	333	40	315	43
Visio Standard 5.0	247	232	6	233	6	219	201	8	199	9
Multitasking	431	373	13	364	16	405	371	8	371	8
SYSMark 2000 Score	**101**	**125**	**24**	**128**	**27**	**108**	**133**	**23**	**137**	**27**
MetaCreations Bryce 4	70	130	86	134	91	75	152	103	156	108
CorelDRAW 9	105	124	18	133	27	113	147	30	152	35
Avid Elastic Reality 3.1	111	115	4	114	3	129	139	8	137	6
Excel 2000	131	141	8	143	9	132	153	16	152	15
Dragon Naturally Speaking Pref. 4.0	64	115	80	117	83	77	123	60	127	65
Netscape Communicator 4.61	131	140	7	139	6	141	133	-6	133	-6
Paradox 9.0	90	105	17	108	20	99	131	32	131	32
Photoshop 5.5	72	140	94	144	100	74	107	45	106	43
PowerPoint 2000	110	119	8	120	9	120	139	16	136	13
Adobe Premiere 5.1	115	123	7	126	10	120	136	13	139	16
Word 2000	132	139	5	142	8	135	162	20	164	21
Windows Media Encoder 4.0	112	120	7	121	8	115	128	11	124	8

% = per cent improvement in performance of 128MB over 64MB, and 256MB over 64MB. Individual PC WorldBench 2000 application figures are actual seconds taken to complete test. SYSMark 2000 figures are actual scores – the larger the figure the better the performance.

performance than NTFS. Applications that particularly benefited from FAT32 were PhotoPaint 8 (17 per cent better than with NTFS), Communicator 4.06 (13 per cent), Naturally Speaking (10 per cent) and Photoshop 5.0 (8 per cent). Many applications and processes recorded less than 2 per cent variance; Paradox 9.0 showed no difference at all.

AMD 64MB

If you own an AMD with 64MB and run Paradox 9.0 and PhotoPaint 8, then you will definitely benefit from NTFS; otherwise, in both PC WorldBench 2000 and SYSMark 2000, FAT32 provided approximately 4 per cent overall better performance than NTFS. As with the Intel, applications that particularly benefited from FAT32 were PhotoPaint 8 (12 per cent) and Netscape Communicator 4.06 (10 per cent), as well as Excel 2000 (11 per cent). Many applications and processes recorded less than 2 per cent variance. Paradox 9.0 was the only application to perform better under NTFS, by 4 per cent.

INTEL 128MB

There was a significant increase in overall performance over 64MB, with 128MB making a 12 per cent improvement to FAT32 and a 13 per cent improvement to NTFS for PC WorldBench 2000. SYSMark 2000 scores improved 24 per cent in FAT32 and 28 per cent in NTFS. Overall, FAT32 returned faster scores while also providing a 12 per cent performance advantage in multitasking over NTFS.

Multitasking with 128MB in FAT32 was 13 per cent faster than with 64MB, while NTFS saw a 6 per cent improvement over 64MB. Applications which made notable performance increases while using 128MB under FAT32 were Paradox 9.0 (17 per cent), CorelDRAW 9 (18 per cent), Photoshop 5.0 (23 per cent), Naturally Speaking (80 per cent), Bryce 4 (86 per cent), Photoshop 5.5 (94 per cent) and PhotoPaint 8 (49 per cent). NTFS benefited even more from the increase in memory, particularly PhotoPaint 8 which improved by 51 per cent and Photoshop 5.5 which improved by 110 per cent. Photoshop 5.5 was the only application to favour NTFS, returning a 5 per cent better score in NTFS than FAT32.

AMD 128MB

128MB significantly increased overall performance compared to 64MB, making a 12 per cent improvement to FAT32 and a 9 per cent improvement to NTFS for PC WorldBench 2000. SYSMark 2000 scores improved 23 per cent in FAT32 and 21 per cent in NTFS. Overall, FAT32 returned faster scores while also providing an 8 per cent performance advantage in multitasking over NTFS.

Multitasking with 128MB in FAT32 was 8 per cent faster than with 64MB, while NTFS saw a 9 per cent improvement over 64MB. Applications which made notable performance increases while using 128MB under FAT32 were Paradox 9.0 (32 per cent), CorelDRAW 9 (30 per cent), Photoshop 5.0 (15 per cent), Naturally Speaking (60 per cent), Bryce 4 (103 per cent), Photoshop 5.5 (45 per cent) and PhotoPaint 8 (40 per cent). NTFS results did not mimic those of the Intel, with the AMD system not realising the same level of benefit. Photoshop 5.5 was one of two applications to favour NTFS, returning a 2 per cent better score in NTFS than FAT32, while Netscape Communicator 4.61 preferred NTFS over FAT32 to the tune of 7 per cent.

INTEL 256MB

There was a modest increase in overall performance from 128MB to 256MB, making a 4 per cent improvement to FAT32 and a 5 per cent improvement to NTFS for PC WorldBench 2000. SYSMark 2000 scores improved 3 per cent in both FAT32 and NTFS. Overall, FAT32 returned faster scores and also

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NTFS

	INTEL					AMD				
	64MB	128MB	%	256MB	%	64MB	128MB	%	256MB	%
PC WorldBench 2000 Score	**124**	**140**	**13**	**146**	**18**	**135**	**147**	**9**	**153**	**13**
Word 97	216	205	5	201	7	200	194	3	194	3
WordPro9	290	278	4	277	5	265	257	3	255	4
Excel 97	302	292	3	290	4	293	287	2	285	3
123 9	775	698	10	698	10	683	646	5	639	6
Access 97	515	495	4	493	4	507	494	3	496	2
Powerpoint 97	273	253	8	247	10	263	243	8	239	9
Communicator 4.06	129	118	9	96	26	122	112	8	92	25
Quicken Deluxe 99	859	854	1	850	1	846	840	1	840	1
Photoshop 5.0	574	417	27	397	31	478	426	11	402	16
PhotoPaint 8	827	407	51	359	57	613	383	38	351	43
Visio Standard 5.0	251	237	5	235	6	220	214	3	213	3
Multitasking	444	416	6	396	11	441	401	9	390	12
SYSMark 2000 Score	**97**	**124**	**28**	**127**	**31**	**104**	**126**	**21**	**129**	**24**
MetaCreations Bryce 4	69	129	87	132	91	72	141	96	150	108
CorelDRAW 9	99	123	24	133	34	108	137	27	147	36
Avid Elastic Reality 3.1	109	115	6	116	6	128	133	4	132	3
Excel 2000	123	135	10	138	12	119	134	13	138	16
Dragon Naturally Speaking Pref. 4.0	58	115	98	115	98	73	111	52	113	55
Netscape Communicator 4.61	129	136	5	134	4	133	143	8	144	8
Paradox 9.0	90	97	8	106	18	103	110	7	104	1
Photoshop 5.5	70	147	110	153	119	71	109	54	110	55
PowerPoint 2000	107	116	8	119	11	111	120	8	126	14
Adobe Premiere 5.1	111	120	8	123	11	113	127	12	130	15
Word 2000	125	137	10	139	11	127	136	7	144	13
Windows Media Encoder 4.0	107	121	13	119	11	114	119	4	121	6

% = per cent improvement in performance of 128MB over 64MB, and 256MB over 64MB. Individual PC WorldBench 2000 application figures are actual seconds taken to complete test. SYSMark 2000 figures are actual scores – the larger the figure the better the performance.

provided a 9 per cent performance advantage in multitasking over NTFS.

Multitasking with 256MB in FAT32 was 16 per cent faster than with 64MB, while NTFS saw a 11 per cent improvement over 64MB. The difference between 128MB and 256MB was much less marked, improving multitasking in FAT32 and NTFS by 2 per cent and 5 per cent, respectively. Of course, most applications did not reveal as drastic an improvement in performance using 256MB over 128MB as they did when 64MB was upgraded to 128MB.

AMD 256MB

Overall performance increased modestly from 128MB to 256MB, making a 5 per cent improvement to FAT32 and a 4 per cent improvement to NTFS for PC WorldBench 2000. SYSMark 2000 scores improved 4 per cent in FAT32 and 3 per cent in NTFS. Overall, FAT32 returned faster scores while also providing a 5 per cent performance advantage in multitasking over NTFS.

Multitasking with 256MB in FAT32 did not provide any performance advantage over multitasking with 128MB, although NTFS provided a 3 per cent advantage over 128MB. Of course, most applications did not reveal as drastic an improvement in performance using 256MB over 128MB as they did when 64MB was upgraded to 128MB.

VIDEO AND GAMING PERFORMANCE

In order to get the best performance from our TNT2 cards we obtained the latest Detonator drivers for Windows 2000 from NVIDIA's Web site. The driver proved to be a bonus to the Intel system but caused great problems when used with the AMD. Although we were able to extract benchmarking results and achieve a suitable level of game play, we did experience instability in the operation of the system — particularly on boot-up, when the system froze on many occasions while entering the Windows 2000 desktop screen. The Intel's runs highlighted no performance difference between NTFS and FAT32, although there was the expected performance increase from 64MB to 128MB and 256MB. Video 2000 scores indicated that there is an increase in video performance under NTFS, although overall performance scores were higher under FAT32.

OBSERVATIONS AND CONCLUSIONS

GRAPHICS ADAPTERS: Installing the TNT2 graphics adapters proved to be a very simple task, with Windows 2000 automatically recognising the devices and installing the present drivers from its driver database. This did not mean we didn't have problems. When we attempted to run Quake III, we were faced with an error pertaining to the graphics adapter's Open GL inabilities. This left us scouring NVIDIA's Web site, where we found the most recent Detonator drivers for Windows 2000, which gave us the ability to satisfy our gaming needs.

MEMORY: Without a doubt, the most common memory configuration for most people's desktop will be 128MB. A quick glance at our result table reveals a significant and noticeable improvement in performance when the systems were upgraded from 64MB to 128MB, but the extra investment does not always return a similar improvement when increasing memory to 256MB.

FILE SYSTEM: And what about the file system? It has long been accepted that NTFS is a supreme performer when compared to its FAT32 counterpart, but from our results you can see that, in many cases, FAT32 outshines NTFS. Unless you require the security benefits of NTFS, you should stick to the FAT32 foundation. ■

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- Memory: 3 x DIMM up to 1GB (PC100)
- Expansion: 5 x PCI, 1 x AMR, 1 x AGP2X/4X
- Easy Setting (FSB, Multiplier and CPU voltage): H/W approach for BIOS protection

TS-AVE3

- VIA Apollo Pro 133A (694X) Chipset; ATX form factor
- CPU: Socket 370 PPGA/FC-PGA 300~933+MHz (Pentium III, Celeron, Cyrix)
- FSB: 66/100/133MHz (66~150MHz overclock range)
- Memory: 3 x DIMM up to 1.5GB (PC100/133/VCM)
- Expansion: 5 x PCI, 1 x ISA/AMR (shared), 1 x AGP4X
- Easy Setting (FSB, Multiplier and CPU voltage): H/W approach for BIOS protection

TS-AWE3

- Intel 810E Chipset; ATX form factor
- CPU: Socket 370 PPGA/FC-PGA 300~933+ MHz (Pentium III, Celeron, Cyrix)
- FSB: 66/100/133MHz (66~150MHz overclock range)
- Memory: 3 x DIMM up to 512MB (PC100)
- Expansion: 5 x PCI, 1 x AMR
- Onboard AGP2X VGA and AC97 Audio; Anti-virus BIOS

TS-AKXA

- VIA Apollo KX133 Chipset; ATX form factor
- CPU: AMD Slot A Athlon (K7) 500 MHz~1 GHz+
- FSB: 200MHz
- Memory: 3 x DIMM up to 1.5GB (PC100/PC133/VCM)
- Expansion: 5 x PCI, 1 x ISA/AMR (shared), 1 x AGP2X/4X
- H/W approach for BIOS protection

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HOME & BUSINESS PCs best buys

HOME PCs

	Make/Model	Value rating	Performance rating	Configuration
HOME				
1	Peripherals Plus Athlon 700	86.1	278 / 4862	AMD Athlon 700, 128MB SDRAM, 13.6GB hard drive, 32MB Leadtek WinFast GeForce graphics adapter
2	Dell Dimension XPS B-800r	85.1	321 / 7221	Intel Pentium III 800, 128MB PC700 356MHz RDRAM, 20.4GB hard drive, 32MB 4x AGP GeForce graphics adapter
3	Dell Dimension XPS T-700r	84.0	288 / 6253	Intel Pentium III 700, 128MB SDRAM, 13.6GB hard drive, 32MB NVIDIA GeForce graphics adapter
4	Peripherals Plus Athlon 600	83.0	273 / 4520	AMD Athlon 600, 128MB SDRAM, 20GB hard drive, 32MB Diamond Stealth III s540 graphics adapter
5	Gateway Performance 850xl	80.3	315 / 7005	Intel Pentium III 850, 128MB SDRAM, 34GB hard drive, 32MB GeForce graphics adapter
6	Peripherals Plus Athlon 800	80.1	296 / 6074	AMD Athlon 800, 128MB SDRAM, 13.6GB hard drive, 32MB Leadtek WinFast GeForce256 DDR graphics adapter
7	Digital Star Power Pro P3-600	79.4	263 / 5410	Intel Pentium III 600, 128MB SDRAM, 20.5GB hard drive, 32MB Creative 3D Blaster GeForce DDR
8	Peripherals Plus Intel Pentium III 600	78.2	241 / 5079	Intel Pentium III 600, 128MB SDRAM, 13.6GB hard drive, 32MB Matrox Millennium G400 dual-head graphics adapter
9	Dell Dimension XPS T-550	77.7	240 / 5147	Intel Pentium III 550, 128MB SDRAM, 15GB hard drive, 32MB Diamond Viper V770 graphics adapter
10	Compaq Presario 7500	73.0	235 / 2655	Intel Pentium III 500, 64MB SDRAM, 13GB hard drive, 8MB Intel 810e integrated graphics
BUSINESS				
1	Gateway E-4400	85.7	246 / 61	Intel Pentium III 600, 64MB RDRAM, 20GB hard drive, 32MB AGP 4x ATI Rage 128VR graphics adapter
2	Acer AcerPower Sn14	83.9	257 / 30.5	Intel Pentium III 650, 128MB SDRAM, 15GB hard drive, 16MB TNT2 graphics adapter
3	Dell Dimension L-500cx	83.2	205 / 37.7	Intel Celeron 500, 128MB SDRAM, 15GB hard drive, Intel 810 integrated graphics with 4MB display cache

1 Peripherals Plus Athlon 700

In the No. 1 position on the Home chart, the Peripherals Plus Athlon 700 — with its blazing performance and fully featured configuration — represents power, versatility and value for either the enthusiast or the upgrader.

Turn your home into a theatre with the slot-loading AOpen DVD drive. DVD playback on this machine is software-assisted through the InterVideo WinDVD software player. The playback quality was smooth and free of annoying jerks and pauses, while images were sharp and clear.

Once the movie's over, bring out the CD copy station. The AOpen 4x4x32 CD-RW drive is an EIDE device that will burn a whole CD from another CD or from an image file on your hard disk in just 20 minutes. Its read spin speed of 32 also means it will provide good CD-ROM performance, which was demonstrated in the Norton Multimedia benchmark (where the drive recorded a score of 8.1).

Feel like having some fun? Pop in your favourite game and let the 32MB GeForce-driven Leadtek graphics card blow your mind with super-high frame rates, gorgeous graphics and rich colours. Frame-rate tests were conducted using Quake II and KingPin, and at a resolution setting of 1024x768, the Athlon 700 recorded scores of 88 and 66 frames per second, respectively. We also ran driving games such as TOCA2, Driver and Re-Volt, and were very impressed by the games' smooth play.

But maybe you just need to type up that overdue assignment and insert some spreadsheets here and there to support your findings. The Athlon 700 provides lightning-quick 2D application speed. Its score of 278 places it in fifth place, behind the Dell Dimension XPS T-700r, in PC WorldBench 98.

Other features of the system include 128MB of SDRAM, a 13.6GB hard drive, a 17in Samsung monitor, an internal 56Kbps modem, a Creative Vibra 128 soundcard and a pair of AOpen speakers, whose large transformer will hog an extra point on your power board. In the software department, the machine comes with Windows 98 SE, Lotus SmartSuite Millennium, Adaptec Easy CD Creator and Direct CD pre-installed. Virus protection is supplied by Norton's AntiVirus. Retailing for $3350, the machine also comes with a three-year, insurance-underwritten, nationwide on-site warranty.

PROS: Performance, DVD, CD-RW

CONS: No sub-woofer

2 Dell Dimension XPS B-800r

The Dimension XPS B-800r incorporates the services of Intel's 820 chip set, which provides performance-boosting features such as Rambus, ATA66 and

BY ELIAS PLASTIRAS

Extra features	Beginner rating	Enthusiast rating	Price/ warranty	Issue reviewed	Vendor
17in Samsung monitor, Pioneer 10x DVD drive, Acer CD-RW 4x4x32, AOpen speakers, internal Dynalink 56Kbps modem, Creative Vibra 128 sound card, Lotus SmartSuite Millennium, Virtual Drive, Norton AntiVirus, Windows 98	★★	★★★★★	$3350 3 years on-site	Jan-00	Peripherals Plus (02) 9630 3166 www.perplus.com.au
19in Trinitron monitor, 8x DVD drive, ADA-885 THX Certified speakers, internal Conexant 56Kbps modem, four-button MouseMan wheel mouse, SB Live! Value sound card, Microsoft Works Suite 2000, Norton AntiVirus 2000, PowerGame Pack II, Windows 98	★★★★	★★★★	$5230 3 years 1 year on-site	Apr-00	Dell 1800 335 502 www.dell.com.au
17in M770 monitor, 8x DVD drive, Altec Lansing ACS-340 speakers, internal 56Kbps modem, Creative SB Live! Value sound card, Microsoft Works Suite 2000, Norton AntiVirus, game pack, Windows 98	★★★★	★★★★	$3709 3 years 1 year on-site	Jan-00	Dell 1800 335 502 www.dell.com.au
17in Samsung monitor, 16x DVD-ROM drive, Acer CD-RW drive, Altec Lansing ACS-33 speakers, internal 56Kbps modem, Acer 10/100 network adapter, Creative Vibra 128 sound card, Lotus SmartSuite Millennium, Norton AntiVirus	★★	★★★★★	$3095 3 years on-site	NEW	Peripherals Plus (02) 9630 3166 www.perplus.com.au
21in VX1100 monitor, 12x DVD-ROM drive, Philips CD-RW drive, Boston Acoustics BA7500 speakers, internal 56Kbps modem, SoundBlaster Live! Value sound card, Microsoft Works Suite 2000, DVD Adventure Suite, Norton AntiVirus	★★★★	★★★★★	$6799 3 years 1 year on-site	NEW	Gateway 1800 500 731 www.gw2k.com.au
17in Sony Multiscan E200 monitor, AOpen 10x DVD drive, Acer CD-RW 4x4x32, AOpen speakers, internal Netcomm 56Kbps modem, Creative Vibra 128 sound card, Lotus SmartSuite Millennium, Virtual Drive, Norton AntiVirus, IBM CD Pack, Windows 98	★★	★★★★★	$4295 3 years on-site	Mar-00	Peripherals Plus (02) 9630 3166 www.perplus.com.au
17in Velta monitor, 8x DVD drive, speakers, internal 56Kbps modem, Creative SoundBlaster Vibra 128 soundcard	★	★★★★	$2949 2 years parts 3 years labour	May-00	Digital Star (02) 9748 2915 www.digitalstar.com.au
17in Sony CPD-E200 Flatron monitor, 10x DVD drive, speakers, internal 56Kbps modem, network adapter, Creative Vibra 128 sound card, Lotus SmartSuite Millennium, Norton AntiVirus, Virtual Drive	★★	★★★★★	$3295 3 years on-site	Feb-00	Peripherals Plus (02) 9630 3166 www.perplus.com.au
19in Philips monitor, 8x DVD drive + decoder card, Sony CD-RW drive, Altec Lansing ADA 880 speakers, 3Com US Robotic 56Kbps modem, SoundBlaster Live! Value sound card, MS Works 99, Norton AntiVirus, game pack	★★★★	★★★★	$3631 3 years 1 year on-site	Apr-00	Dell 1800 335 502 www.dell.com.au
15in Compaq monitor, 40x CD-ROM, JBL speakers, internal 56Kbps modem, multimedia keyboard, integrated sound, Microsoft Word 2000, Works 2000, Encarta 2000, Money 99, Ring Central Fax, Recoil, McAfee Antivirus, Compaq Carbon Copy Host	★★★★★	★★	$2499 1 year on-site	May-00	Compaq 1300 360 737 www.compaq.com.au
17in EV700 monitor, 40x CD-ROM drive, 3Com Etherlink 10/100 network adapter, Wake-On-LAN, tamper switch, integrated sound, Intel Landesk Client Manager, Windows NT 4.0 or Windows 2000	★★	★★	$3299 3 years 1 year on-site	Apr-00	Gateway 1800 500 731 www.gw2k.com.au
17in Acer 77xc monitor, 40x CD-ROM drive, 10/100 network adapter, Wake-On-LAN, tamper switch, case lock, AOpen speakers, integrated sound, Lotus SmartSuite Millennium, Quicken Buisiness, BizSmart, PC-Cillin, Windows 98	★★★★	★★★	$2499 3 years 1 year on-site	NEW	Acer 1300 362 328 www.acer.com.au
17in M770 monitor, 48x CD-ROM drive, 10/100 network adapter, Wake-On-LAN, tool-less case, Kensington lock, SB Live! sound card, MS Office 2000 SBE, Norton AntiVirus, Windows 98	★★★★	★	$2570 3 years 1 year on-site	Nov-99	Dell 1800 335 502 www.dell.com.au

LEGEND
PC WorldBench 98
3DMark 99 Max
Norton Multimedia

WHAT THE RATINGS MEAN

The Value Rating is the cumulative score achieved after the evaluation of the systems' performance, configuration, features, ease of setup and use, expandability, price, warranty, service and support. This score is what the Best Buys charts are ranked by and it indicates how much value you are getting for your dollar.

The Home and Sub-$2000 PCs Performance Ratings are comprised of the PC WorldBench 98 result and the FutureMark 3DMark 99 Max result, while the Business PCs Performance Rating is comprised of the PC WorldBench 98 result and the Norton's Multimedia Benchmark score. These results are incorporated into the Value Rating. The Beginners Rating is an indicator of the ease of setup and use of the system. A Five Star Beginners Rating means that the system ships with a recovery CD, preinstalled software, a fold out setup guide, colour coded jacks, free telephone support and Internet support.

The Enthusiast Rating is an indicator of the expandability and upgradeability of the system. A Five Star Enthusiast rating indicates that you can upgrade the motherboard, graphics adapter, memory and hard-disk drive and that two free 3.5in bays and two free 5.25in bays are provided.

AGP 4x. Its configuration includes an 800MHz Pentium III CPU, 128MB of PC700 356MHz RDRAM and a 32MB GeForce graphics adapter. A spacious 20GB hard drive looks after storage space, while optical media is read through the 8x DVD drive. The Dell Dimension XPS B-800r is a top of the range system that is definitely aimed at the power seeker, and suits the enthusiast or gaming freak rather than the beginner.

3 Dell Dimension XPS T-700r

Dell's engineers have combined Intel's new Coppermine processor with NVIDIA'S new GeForce graphics accelerator and 128MB of SDRAM to create an absolute monster of a machine! Running at 700MHz, and one of the latest in the line of T Series Dimension machines, it broke records left, right and centre. Its score of 288 in PC WorldBench 98 makes it approximately 3.5 per cent faster than the Peripherals Plus Athlon 700, which scored 278.

4 Peripherals Plus Athlon 600

NEW The latest Peripherals Plus machine to grace the benches of the Test Centre is a powerful little Athlon-based system running at 600MHz. It did very well in our testing, reaching a mark of 273 in PC WorldBench 98 — a score well above average for a machine in this speed class. In fact, it wasn't that far off its stablemate, the Peripherals Plus Athlon 700, which is currently atop the Home chart and has a PC WorldBench 98 score of 278. In PC WorldBench 2000 the machine recorded 132, while in SYSMark 2000 it achieved 129.

The machine's configuration includes 128MB of SDRAM, a 32MB Diamond Stealth III s540 video card, a 20GB ATA66 Quantum hard drive as well as a 16x DVD-ROM drive. This is the first time we have seen a DVD-ROM drive of this speed in the Test Centre, and in the Norton

Multimedia benchmark its CD-ROM performance showed no gain over slower DVD-ROM drives. Where you will see the performance difference, though, is with DVD software, which will be accessed much faster due to the higher spin speed. DVD movies will not be affected by this speed, but the machine did provide excellent movie playback via the pre-installed InterVideo WinDVD software. Internet connectivity is handled by an internal Netcomm modem, and the included Acer 10/100 Ethernet adapter makes this system network ready.

A Creative Vibra 128 card provides sound, and its output comes through a set of Altec Lansing speakers that consists of two satellites and a sub-woofer. They are great for gaming and provide a nice soundscape for movies as well.

In the gaming arena, this machine is adequate and will play all the latest games. Although super high resolutions will not play well on the Diamond Stealth video adapter, at the 1024x768 setting we obtained frame rates of 31, 28 and 30 in Quake II, Quake III and KingPin, respectively. In 3DMark 99 Max, the machine scored 4520, and under 3DMark 2000 it received 1247 3D Marks.

Enthusiasts will be happy to know that there are no fewer than six PCI slots on the Microstar MS-6195 motherboard as well as three DIMM slots. Drives bays total five in the AOpen ATX midi case, and there are two free CD-ROM bays, but only one free hard drive bay. Cooling is aided by the addition of a fan at the front of the case, while the CPU benefits from the services of a big heatsink and dual fan assembly.

For $3095 this system is a good all-rounder, providing great business application performance, adequate gaming and DVD movie playability. It ships with a three-year on-site warranty, and Lotus SmartSuite as well as anti-virus software.

PROS: Excellent 2D performance
CONS: Only one free hard drive bay

5 Gateway Performance 850xl

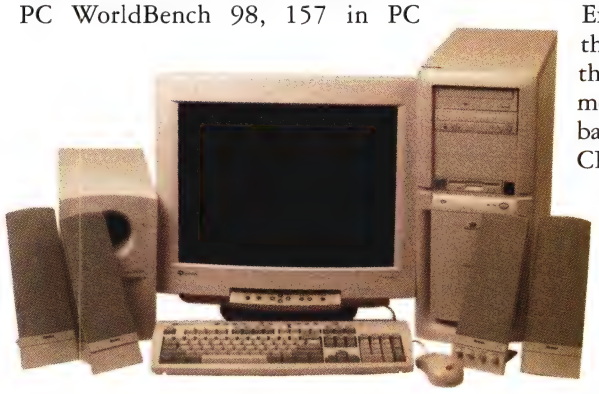
NEW The Gateway Performance 850xl is a brute of a machine — physically as well as in its configuration. It comes equipped with a huge 21in Trinitron tube-based monitor, so you'd better make sure you have enough room in the house. Not just the monitor is big: the full-tower ATX case that Gateway has used is an extremely solid unit and weighs quite a bit on its own, and the Boston Acoustics Dolby Digital speakers will also hog some floor space with their pounding sub-woofer box. It's a great machine for the enthusiast, tinkerer or gamer alike, with a fully featured configuration and good all-round performance.

In the engine room is a fast 850MHz Pentium III processor, which resides on a BX-based platform with 128MB of SDRAM, rather than an i820 platform with more expensive RDRAM. In our benchmarking tests the machine scored a blistering 315 in PC WorldBench 98, 157 in PC WorldBench 2000 and 158 in SYSMark 2000.

Heading the graphics department is a 32MB DDR GeForce adapter, which features a TV-out and a Digital (DVI-D) output as well as a normal VGA port on its mounting bracket. It contributed greatly towards the system's overall 3DMark 99 Max score of 7005. We also tested the machine under 3DMark 2000 and received a score of 4704 3D Marks. Our frame rate tests were conducted with Quake II, Quake III and KingPin at a resolution of 1024x768 at the default colour depth, and garnered results of 132fps, 83fps and 102fps, respectively. We played NBA Live 2000, a Direct3D-based game, and Soldier Of Fortune, an OpenGL-based game, to get a feel for the gaming power of this machine. At resolutions of 1600x1200 and using maximum texture detail and colour depth, we experienced no noticeable glitches in performance.

Providing storage is a roomy 34GB ATA66 hard drive. A Philips CD-RW is installed for creating CDs. For movie buffs, a 12x DVD-ROM drive is included, which combines with the aforementioned Boston Acoustics speakers and massive 21in monitor to give you a great home theatre experience.

In the connectivity stakes, it's all there — one parallel, two serial, two PS/2 and two USB ports. A multifunction keyboard assists typing, while pointing duties are assigned to a Microsoft Intellimouse, which has two buttons and a scroll wheel.



Expandability is possible through five PCI slots and three DIMM slots on the motherboard, while drive bays are plentiful for both CD-ROM and floppy-sized drives. The case provides excellent ventilation and air-flow, with a case fan installed in the rear to aid in the extraction of warm air; the CPU is cooled with a big heatsink and fan

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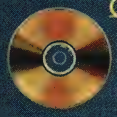

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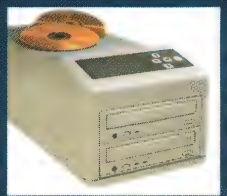

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configuration that is cocooned in a plastic shroud.

Its $6799 price tag is quite a bit of money to part with for a computer system, but you do get excellent performance as well as a lot of fun out of the deal. A standard three-year (one year on-site) warranty is provided, and software bundling includes Microsoft Works Suite 2000, a DVD Adventure Suite, Norton AntiVirus and Gateway GoBack.

PROS: Huge monitor, good 2D and 3D performance

CONS: Takes up a lot of room

6 Peripherals Plus Athlon 800

Much like its 700MHz stablemate, the $4295 Peripherals Plus Athlon 800 incorporates a fully featured configuration and provides powerful 2D and 3D performance. At 800MHz, this machine is almost 7 per cent faster than the 700MHz version, achieving a high score of 296 in PC WorldBench. Unlike the previous versions of the Athlon processor, this chip is manufactured using 0.18 micron technology, which means the chip is physically smaller and does not produce as much heat.

7 Digital Star Power Pro P3-600

For under $3000, this little system provides scorching performance for productivity users as well as gamers. The machine is well put-together and housed in a stable ATX mid-tower case. Inside, it is very clean, and the sheet metal has been buffed to a shine. Safety has also been considered: all sharp edges have been folded back.

For the enthusiast, there is room to tinker — the case provides two free 5.25in bays, plus one free 3.5in bay. On the motherboard lie three DIMM slots for memory (two free), as well as five PCI slots (three free), but there are no ISA slots. Upgrading the CPU might be tricky, though, as the power supply sits directly in front of it and would need to be removed first.

8 Peripherals Plus Intel Pentium III 600

In the performance department, this $3295 machine produced a score of 241 in PC WorldBench, and in 3DMark 99 Max it finished with 5079 3D Marks. Frame rate tests conducted with Quake II and KingPin at a resolution of 1024x768 gave us 69 and 40fps, respectively.

As is typical of Peripherals Plus systems, the components come enclosed in a sturdy AOpen mid-tower ATX case which provides the enthusiast with three 5.25in and three 3.5in drive bays, and has a powerful 300Watt power supply. The motherboard is based on Intel's i820 chip set, but contains only two DIMM slots, and the elimination of ISA slots means there are five PCI slots to accommodate upgrading and expansion.

9 Dell Dimension XPS T-550

Costing $3631, the XPS T-550 is packed with features, including DVD-ROM and CD-RW drives, and an Altec Lansing subwoofer speaker system. Graphics are handled by the Diamond Viper V770 graphics adapter, which features NVIDIA'S TNT2 graphics chip, and has 32MB of onboard memory.

10 Compaq Presario 7500

From Compaq comes an easy-to-use and well performing system, which is perfect for beginners or for people just looking for a reliable Internet and productivity machine. The Presario 7500 is built upon Intel Pentium III technology and this particular model runs at 500MHz. It utilises an i810 chip set, which provides integrated graphics as well as integrated stereo sound; as such, it is not a good proposition for the enthusiast or the gamer. It does provide great business application performance, reaching a mark of 235 in PC WorldBench 98, a score that is a little above the average for this CPU class.

BUSINESS PCs

1 Gateway E-4400

Power-hungry business users have no need to look past the Gateway E-4400, for it provides the latest advancements in PC technology, such as Rambus, ATA66, AGP 4x and a 133MHz front side bus, as well as essential networking and security features and a tool-less housing. The $3299 price tag brings you a Pentium III 600MHz processor, 64MB of RDRAM, 20GB of storage space, a

SOFTWARE PRICE GUARANTEE*

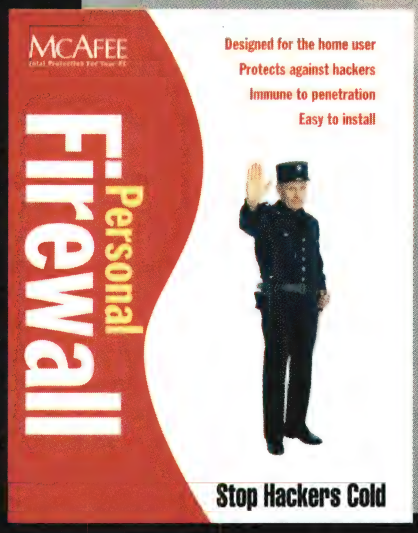
THE ULTIMATE INTERNET PROTECTION PACK

All this for just $149

Valued at over $279 if purchased separately.

Normally $49.95

McAfee Firewall.
Using the Internet can expose you to some serious dangers, such as malicious hackers intent on stealing your personal information. Fortunately, McAfee Firewall works silently in the background to provide comprehensive protection against Internet threats. MFPF



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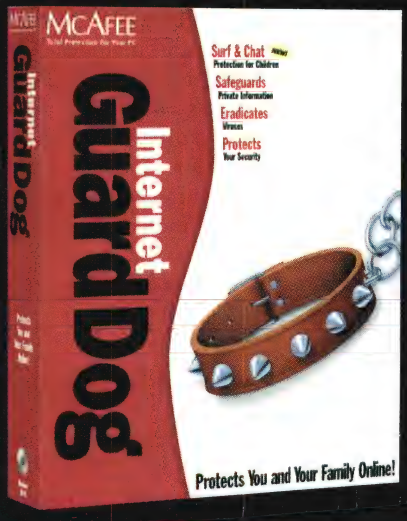
McAfee Internet Guard Dog.
Provides on-line protection for your children, safeguards your private information, eradicates viruses and protects your security. MFGD2



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Spikefree Powerfax Filter.
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40x CD-ROM drive, integrated audio and an ATI Rage 128VR graphics adapter. Network connectivity is handled by a 3Com Etherlink 10/100 PCI network adapter.

Our performance results show that the E-4400 is powerful in both 2D and 3D environments, and even more power can be obtained with the 733MHz model. We found the 733MHz model to be approximately 16 per cent faster than the 600MHz version, but could not include it in this month's Best Buys as we could not get a recommended retail price by the time of writing.

Although we tested the machine with Windows 98, it will ship with either Windows NT 4.0 or Windows 2000, depending on your needs. The system components come housed in a tool-less NLX form-factor case, which can be positioned as either a desktop or a mini-tower, and provides easy access to the system's interior. Sliding drive bays are implemented to increase maintenance efficiency, and the hard drive can be easily removed by lifting a ring lever.

Network management tools include Wired For Management, DMI 2.0 and Wake-On-LAN, while hardware security features include an anti-tamper switch, which is located on the system's chassis. The machine is upgradable via five PCI slots and an AGP slot, and the two RIMM slots give this system a potential maximum memory capacity of 1GB when 512MB modules are introduced. A 17in Gateway monitor is included in the configuration and bundled software includes LANDesk Client Manager 6.0 although productivity software is lacking. A three-year warranty, which includes one-year on-site service, is part of the standard issue.

PROS: Excellent performance, tool-less case

CONS: Lacks a productivity software bundle

2 Acer AcerPower Sn14

NEW Utilising a 650MHz Pentium III processor, the AcerPower Sn14 is a potent little system when it comes to business application performance. We ran PC WorldBench 98, PC WorldBench 2000 and SYSMark 2000 and received results of 257, 130 and 128, respectively. The configuration includes 128MB of SDRAM, a 15GB hard drive, a 40x CD-ROM drive and a 16MB graphics adapter powered by a TNT2 chip set.

The system is built upon a motherboard that is based on the Ali Aladdin Pro chip set and features an on-board sound controller. The other components, such as graphics and networking, are not integrated, and this makes the system expandable for the future. It contains an AGP slot, three PCI slots and two DIMM slots for memory, while the CPU connection is of the Slot 1 variety.

Housed in a lockable micro-tower ATX case, the machine has an average footprint size and can be easily placed underneath a desk for convenience if desk space is at a premium. Maintenance is facilitated by the implementation of a swing-out drive bay that lets you easily replace the floppy and hard drives. On the floor of the machine is a handy sticker that identifies the layout of the motherboard and all its connections. There is a case tamper switch, but it was not connected.

An integral part of a business computer system is its monitor. You don't want to be looking at a flickering 14in monitor for 10 straight hours! Acer ships its AcerPower Sn14 with a good-looking 17in AcerView monitor, and this offers a comfortable 15.9in of viewing area at a flicker-free resolution of 1024x768 at 89Hz. A set of AOpen speakers adds to the multimedia capabilities of the machine.

Network management is aided by the Ethernet adapter's Wake-On-LAN support. Business productivity software includes Lotus SmartSuite Millennium, Quicken and BizSmart, Acer's own Internet portal that simplifies online information gathering.

Offered for a price of $2499, the machine comes with excellent support, including a three-year (one-year on-site) warranty.

PROS: Good 2D performance

CONS: None

3 Dell Dimension L-500cx

Dell has gone to great lengths to ensure that system installation is as painless as possible, with the inclusion of fold-out placemats, colour-coded plugs and quickly accessible registration numbers. In the performance department, the L-500cx registered a score of 37.7 in Norton's Multimedia, thanks largely to the SoundBlaster Live! sound card and fast CD-ROM drive. The $2570 price tag includes a three-year warranty with one year on-site. ■

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SUB-$2000 PCs best buys

SUB-$2000 PCs

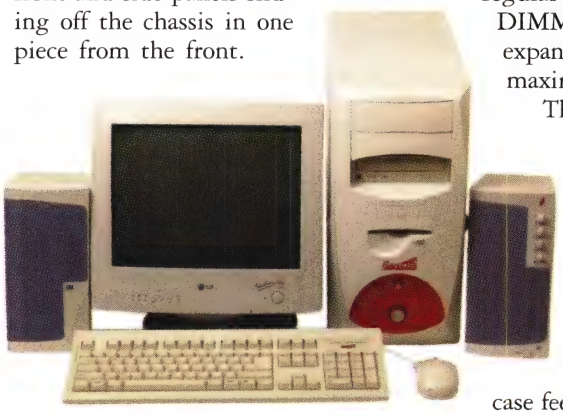
	Make/Model	Value rating	Performance rating	Configuration
SUB-$2000 PCs				
1	Beyond SuperO M-Class	65.2	262 5089	Intel Pentium III 600, 128MB SDRAM, 10.2GB hard drive, 32MB TNT2 M64 graphics adapter
2	Dell Dimension L-600r	64.8	254 3257	Intel Pentium III 600, 64MB SDRAM, 10GB hard drive, 4MB Intel 810 graphics
3	Peripherals Plus Athlon 600	58.7	254 266	AMD Athlon 600, 64MB SDRAM, 10GB hard drive, Diamond Speedster A55 graphics card
4	Packard Bell Club 533C	52.5	198 n/a	Intel Celeron 533, 64MB SDRAM, 10GB hard drive, 4MB Intel 810 graphics

1 Beyond SuperO M-Class

NEW For under $2000, this Pentium III-powered system is highly recommended if you're looking for a bang for your buck! It comes configured with a 600MHz processor, 128MB of SDRAM, a TNT2 M64 graphics adapter, a 10.2GB hard drive as well as a 48x Sony CD-ROM drive. This configuration will give you excellent speed in the 2D world and will also provide you with a good gaming platform.

In PC WorldBench 98 the machine produced a score of 262, while in PC WorldBench 2000 it scored 133 and in SYSMark 2000, 123. In 3DMark 99 Max, a score of 5089 was obtained, and in 3DMark 2000 it recorded 2235 3D Marks.

The machine's components reside in a midi-tower ATX case, the front panel of which contains an orange bubble holding the power and reset switches. It is a tool-less case, the front and side panels sliding off the chassis in one piece from the front.



Unfortunately, this makes the case feel flimsy, as the side panels appear loose because they are not screwed down securely.

The chassis of this case does look very futuristic once the cover is off, though, with the top supports sporting a pipe look. For fiddlers and enthusiasts, it's a very roomy case that is quite easy to work on, and expansion is by way of two free CD-ROM-sized drives and one floppy-sized drive.

The cornerstone of the system is a motherboard based on the i820 chip set which features ATA66 support and also supplies sound and modem facilities. It's a Slot 1 board, and a Slot 1 CPU converter has been used to install the Pentium III 600MHz processor, which has been manufactured in the FCPPGA (flip chip plastic pin grid array) packaging.

The processor plugs into this converter and then this converter is placed in the Slot 1 socket, just like a regular processor cartridge. Two DIMM slots facilitate memory expansion and give the system a maximum capacity of 1GB.

The system is also supplied with a 15in LG monitor and speakers, but, unfortunately, does not come with a software bundle other than the necessary driver disks.

PROS: Excellent performance

CONS: No software bundle, case feels flimsy

2 Dell Dimension L-600r

Within the compact confines of Dell's tool-less micro tower chassis lies the 600MHz Intel Pentium III powerplant, which helped the L-600r achieve its PC WorldBench 98 score of 254.

Coupled with this Socket 370 PPGA processor is 64MB of 100MHz

SDRAM, a 10GB Ultra ATA hard drive and an integrated direct AGP 4MB graphics controller. From this configuration, you can guess that the motherboard is based on Intel's 810 chip set.

SoundBlaster 64V integrated sound combines with the standard 48x CD-ROM drive for multimedia. Rear panel ports and jacks include the standard serial, parallel and VGA ports as well as two USB ports. The four Dell troubleshooting/status lights sit just above the midi/joystick port and the three audio jacks.

There is some room for expandability within the case, with four free PCI slots as well as a spare 3.5in bay accessed by mounting the hard drive upright at the front of the chassis.

Memory and hard disk drives can be upgraded to 512MB and 20GB, respectively, while extra options include an integrated 10/100 Ethernet controller, DVD-ROM drive and LS-120 drive.

BY ELIAS PLASTIRAS

Extra features	Beginner rating	Enthusiast rating	Price/ warranty	Issued reviewed	Vendor
15in LG monitor, 48x CD-ROM drive, speakers, integrated 56Kbps modem, integrated sound	★	★★★★	$1999 3 year limited	NEW	Beyond Computers 1300 130 029 www.by.com.au
15in Dell monitor, 48x CD-ROM drive, internal 56Kbps modem, integrated sound, Microsoft Works 2000	★★★★★	★★	$1999 3 years 1 year on-site	May-00	Dell 1800 335 502 www.dell.com.au
17in Samtron monitor, 50x Acer CD-ROM, Altec Lansing ACS-33 speakers, internal 56Kbps Netcomm modem, Creative Vibra 128 sound card, Lotus SmartSuite Millennium, Norton AntiVirus, IBM CD Pack	★★	★★★★	$1995 3 years on-site	May-00	Peripherals Plus (02) 9630 3166 www.perplus.com.au
15in Packard Bell monitor, 40x CD-ROM drive, speakers, internal 56Kbps modem, integrated sound, Packard Bell Navigator, Microsoft Word/Money/Works 2000, education and games software	★★★★★	★★	$1999 1 year	May-00	Packard Bell (02) 9700 5075 www.packardbell.com.au

LEGEND

PC WorldBench 98

3DMark 99 Max

WHAT THE RATINGS MEAN

The Value Rating is the cumulative score achieved after the evaluation of the systems' performance, configuration, features, ease of setup and use, expandability, price, warranty, service and support. This score is what the Best Buys charts are ranked by and it indicates how much value you are getting for your dollar.

The Home and Sub-$2000 PCs Performance Ratings are comprised of the PC WorldBench 98 result and the FutureMark 3DMark 99 Max result, while the Business PCs Performance Rating is comprised of the PC WorldBench 98 result and the Norton's Multimedia Benchmark score. These results are incorporated into the Value Rating. The Beginners Rating is an indicator of the ease of setup and use of the system. A Five Star Beginners Rating means that the system ships with a recovery CD, preinstalled software, a fold out setup guide, colour coded jacks, free telephone support and Internet support.

The Enthusiast Rating is an indicator of the expandability and upgradeability of the system. A Five Star Enthusiast rating indicates that you can upgrade the motherboard, graphics adapter, memory and hard-disk drive and that two free 3.5in bays and two free 5.25in bays are provided.

3 Peripherals Plus Athlon 600

Boasting the only Athlon processor-based system on the sub-$2000 chart, the Peripherals Plus Athlon 600 has plenty of speed up its sleeve. And it showed in PC WorldBench 98, where the machine notched up a score of 254 — exactly the same as the Dell Dimension L-600r. Like all the machines in this category, it's ideally suited to the 2D domain of applications and Internet surfing, for which an internal 56Kbps Netcomm modem is included. A Creative Vibra 128 sound card shows off its wares on a set of Altec Lansing ACS-33 speakers comprising a sub-woofer and two satellite speakers. Visual output is produced on a 17in Samtron monitor, which has a viewable area of almost 16in.

It is clear that time and care has been taken in the assembly process, as inside the machine all cables are neatly folded back, tied, and secured out of harm's way where possible. The mid-tower AOpen case is also very clean and an extra case fan has been added to the front to provide air circulation. A heatsink with two fans attached to its back is used to cool the processor.

4 Packard Bell Club 533C

The Club 533C is built to get the average user on the Net and let them run multimedia productivity applications with ease. Geared toward the budget user who needs instant productivity without further money outlay, the Club 533C is comprehensively bundled with Windows 98 SE as well as Microsoft Word 2000, Money 2000 and Works 2000. Fiddlers will be happy to note that it ships with PC Doctor and Norton's AntiVirus to safeguard you against any nasties.

The 15in multimedia monitor that ships with the system boasts 14in of viewable area and includes side-mounted stereo speakers.

The keyboard is solid, with nice travel on the keys, and includes a dozen extra pre-programmed one-touch launch buttons. The pointing device is a 3D mouse with scroll wheel.

Performance is more than adequate to handle the included software and the system returned a PC WorldBench 98 score of 198, which is commensurate with its configuration. An ideal out-of-the-box solution for the novice, although seasoned game players would require a beefier graphics configuration. ■

NOTEBOOKS best buys

POWER NOTEBOOKS

	Make/Model	Value rating	Performance rating	Configuration
POWER				
1	Gateway Solo 2150xl Deluxe	93	220	Intel Pentium III 500, 96MB RAM, 12GB HDD, ATI 4MB Mobility-M , 14.1in active TFT, 4x DVD-ROM drive, integrated 56Kbps data/fax modem, 12 cell Li-Ion battery, stereo sound, USB, one-touch launch keys, casual carry case; plus, optional PC Card hardware, DVD decoding with AV-out, S-Video and digital out
2	Compaq Armada E500	91	242	Intel Pentium III 650, 64MB RAM, 12GB HDD, 8MB Rage Mobility-P 3D, 14.1in active TFT display, 6x DVD-ROM drive, internal 56Kbps modem/NIC combo, external volume controls, TV-out, USB
3	Gateway Solo 9300xl Deluxe	87	245	Intel Pentium III 650, 128MB RAM, 18GB HDD, 8MB Rage Mobility-P 3D, 15.7in active SXGA TFT, 6x DVD-ROM drive, LS-120 Super disk drive, FireWire, internal 56Kbps modem, external CD controls, Internet access buttons, supports NTSC and PAL video connection to standard TV monitors with RCA connector, leather Samsonite bag
3	Compaq Armada M700	86	239	Intel Pentium III 500, 64MB RAM, 10GB HDD, 8MB Rage Mobility, 14.1in CTFT XGA, integrated 56Kbps V.90 compliant mini modem/NIC combo, CD-ROM drive, stereo sound, USB, TV-out
4	Acer TravelMate 734TL	80	249	Intel Pentium III 600, 64MB RAM, 12GB HDD, 8MB ATI Range Mobility M1, 15in active TFT display, 24x CD-ROM, integrated 56Kbps modem, Ethernet adapter, VGA-out, USB
4	Dell Inspiron 3800	80	260	Intel Pentium III 650, 128MB RAM, 18GB HDD, 8MB Rage Mobility, 14.1in active TFT display, 6x DVD-ROM drive, 56Kbps modem, TV-out, both pointing stick and touch pad controlling devices
5	IBM ThinkPad 600X	79	255	Intel Pentium III 650, 64MB RAM, 12GB HDD, 4MB NeoMagic MagicGraph, 13.3in active TFT, 6x DVD-ROM, 56Kbps integrated V.90 modem, TV-out, USB, stereo sound
VALUE				
1	Compaq Armada M300	83	225	Intel Pentium III 500, 64MB RAM, 6GB HDD, 4MB ATI LT Pro, 11.3in TFT, integrated 56Kbps V.90 compliant mini modem/NIC combo, external FDD, USB; plus optional Mobile Expansion Unit with 24x CD-ROM, stereo sound
2	IBM ThinkPad iSeries 14AM	78	186	Intel 466 Celeron, 64MB RAM, 6GB HDD, 4MB ATI Rage Mobility M graphics controller, 13in passive display, 24x CD-ROM, integrated 56Kbps modem, S-Video and VGA out, autonomous CD Player
3	Compaq Presario 1200	76	178	AMD K6-2 450MHz with 3DNow!, 64MB RAM, 5GB HDD, 4MB Trident CyberBlade, 12.1in HPA, integrated 56Kbps V.90 compliant modem, 24x CD-ROM drive, JBL Pro audio stereo sound, USB
4	Dell Latitude LS	75	185	Intel Pentium III 400, 128MB RAM, 6.4GB HDD, 2.5MB NeoMagic Magic 2000, 12.1in active TFT, magnesium alloy chassis, 24x CD-ROM, modular drive bay, compatibility with other Latitude C-Series modules, stereo sound card, USB, integrated 56Kbps V.90 modem, integrated 10/100 Ethernet NIC
5	NEC Versa Lite FX	70	202	Intel Pentium III 500, 64MB RAM, 12GB HDD, 4MB Silicon Motion SM710 Lynx EM, 12.1in active TFT, external 24x CD-ROM and 3.5in floppy, 3D surround, integrated 56Kbps modem, 3 USB ports

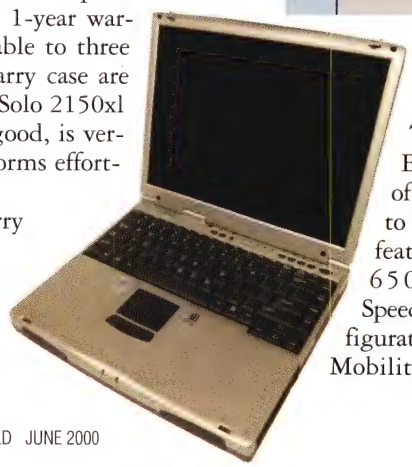
1 Gateway Solo 2150xl Deluxe

NEW At $4799, this machine is outstanding value for money from the flagship of the Solo 2150 range. This feature-rich desktop replacement, weighing little more than 3kg, consistently handled all the benchmarks thrown at it. Behind the performance result of 220 in PC WorldBench 98 is a PIII 500MHz processor, 96MB of RAM, 12GB Ultra ATA hard drive and 4MB 2x AGP 3D graphics accelerator. In addition to the active TFT 14.1in monitor, the Deluxe is equipped with built-in everything, including custom launch buttons and volume controls, a 56Kbps V.90 data/fax modem, 4x DVD-ROM drive with software, Creative EV 1938 16-bit sound controller and stereo speakers. Our review model was optioned up with the Margi DVD-to-Go PC Card hardware DVD decoder, which bumped the total price up to $5098. The hardware DVD decoder with TV/AV-out lets you hook your notebook to your TV and watch DVD movies on your television. Battery life test result of the 12-cell Lithium-Ion unit was sensational, giving 3 hours and 20 minutes of non-stop use away from the power outlet.

All productivity software is preinstalled and, in addition to Windows 98 SE, MS Works suite and Norton's Antivirus, a simple recovery utility called GoBack allows you to restore your system should you screw it up with a dodgy hardware or software installation. To complete the package, a 1-year warranty (upgradable to three years) and a carry case are included. The Solo 2150xl Deluxe looks good, is versatile and performs effortlessly.

PROS: Price, carry case, DVD, battery life

CONS: Only a 1-year warranty



2 Compaq Armada E500

The Compaq Armada E500 makes excellent use of its high-end configuration to excel in performance and features. Based on Intel's 650MHz Pentium III SpeedStep processor, the configuration of 8MB ATI Rage Mobility graphics controller, 12GB hard disk drive and 64MB of RAM combined to produce a PC WorldBench 98 score of 242. Compaq's new asking price of $5776 represents very good value, considering the performance and the extras such as the 14.1in active TFT, 6x DVD-ROM drive, internal modem and Ethernet combo. Compaq is also sensitive to Total Cost of Ownership (TCO) issues and, as such, the Armada E500 is

BY SPIRO HIONIS

Beginner rating	Enthusiast rating	Price/ warranty	Issue reviewed	Vendor
★★★★★	★★★★	$4799 + $299 for hardware DVD decoding 1 year RTB	NEW	Gateway 1800 500 731 www.gw2k.com.au NEW
★★★★	★★★★	$5776 promotional price 1 year RTB	Apr-00	Compaq www.compaq.com.au 1300 360 737
★★★★	★★★★★	$7999 3 years	Apr-00	Gateway 1800 500 731 www.gw2k.com.au
★★★★	★★★★★	$6541 3 years incl. pick-up & 48hr workshop turnaround	NEW	Compaq 1300 360 737 www.compaq.com.au
★★★★	★★★★	$6999 1 year with 2hr warranty service/ repair turnaround	May-00	Acer 1800 362 328 www.acer.com.au
★★★★	★★★★	$6181 1 year NBD	May-00	Dell 1800 335 502 www.dell.com.au
★★★★	★★★★	$8600 3 years international	Apr-00	IBM 1800 815 154 www.ibm.com.au
★★★★	★★★	$4416 + $595 for Mobile Exapnsion Unit 1 year incl pick-up & 48hr workshop turnaround	NEW	Compaq 1300 360 737 www.compaq.com.au
★★★★	★★★	$2999 1 year RTB	May-00	IBM 1800 815 154 www.ibm.com.au
★★★★	★★	$2799 1 year RTB	NEW	Compaq 1300 360 737 www.compaq.com.au
★★★★	★★★★	$6323 3 years on-site NBD	Apr-00	Dell 1800 335 502 www.dell.com.au
★★★★	★★★★	$6100 1 year RTB	May-00	NEC Computers Australia 1800 027 026 www.nec.com.au

LEGEND

PC WorldBench 98 Norton Multimedia

WHAT THE RATINGS MEAN

The Value Rating is the cumulative score achieved after the evaluation of the system's performance, configuration, features, ease of setup and use, expandability, price, warranty, service and support. This score determines the ranking in the Best Buys charts and it indicates how much value you get for your dollar. Performance Rating comprises the PC WorldBench 98 result and the Norton's Multimedia Benchmark scores. These results are incorporated into the Value Rating. The Beginners Rating is an indicator of the ease of setup and use of the system. A Five Star Beginners Rating means that the system ships with a recovery CD, preinstalled software, a fold-out setup guide, well placed controls, telephone support and Internet support. The Enthusiast Rating is an indicator of the expandability and upgradeability of the system. A Five Star Enthusiast rating indicates that you can upgrade the graphics adapter and system memory, have user-removable hard-disk drives, smart bays, Type III PC-Card slot, video-out and docking station/port replicator facilities.

POWER AND VALUE CATEGORY OF NOTEBOOKS

A notebook must satisfy at least four out of the five requirements to enter the Power Category. These requirements will be updated to reflect current processor technologies as well as recommended hardware configurations for cutting edge operating system and productivity software.

The following minimum configuration is effective from PC World April 2000:

1. Minimum processor size to be Intel Pentium III 400MHz (up from PII 366)
2. Screen size to be at least 13.3in
3. Minimum hard disk to be 10GB (up from 6.4GB)
4. System RAM to be minimum 128MB (up from 64MB)
5. Graphics adapter minimum 4MB

Notebooks that do not satisfy the Power category requirements will be submitted to the Value category.

compatible with common Compaq options and docking solutions across its range. All up, a solid, high-performance business system designed to keep users, IT managers and the company bean counters very happy.

3 Gateway Solo 9300xl Deluxe

This 650MHz Pentium III SpeedStep notebook offers a strong set of features as well as blistering performance. The system includes a massive 15.7in active TFT SXGA display, driven by an excellent ATI Rage Mobility-P 3D VGA adapter. Storage is provided by the 18GB removable Ultra ATA hard-disk drive as well as the LS-120 Super disk drive. A 6x DVD-ROM drive combines with a 16-bit stereo PCI audio accelerator and built-in stereo speakers. Other features include Dolby AC-3 digital audio output port, composite video-in port and video-out port. The Solo 9300xl Deluxe weighs just under 4kg, in a slim design only 42mm thick. Expandability and versatility are excellent, while battery power is provided by a 12-cell Li-Ion unit. Price for this model is $7999 and Gateway includes a three-year parts and labour warranty.

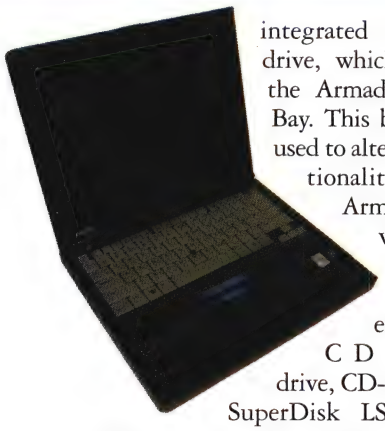
4 Compaq Armada M700

NEW The $6541 Armada M700 previously appeared in our charts in its PII 400 guise and dropped out when Compaq stopped making the 700 in that configuration. For its return, Compaq offers a number of Intel processor configurations: our review model shipped with a 500MHz PIII with SpeedStep technology. Compaq says it has designed the Armada M700 for "the professional mobility user who wants the ideal balance between the highest level of portability and latest mobile computing technologies ...". Like the previous M700, this model achieves its designers' objective by packing most of the functionality of a desktop system into a 28mm thick magnesium alloy case having an overall weight of little more than 2kg.

In addition to the PIII 500MHz processor, configuration includes 64MB of RAM, an 8MB 3D graphics controller and 14.1in screen. Other integrated features that aid functionality are an internal 56Kbps V.90 modem, internal 10/100 Ethernet NIC and

new tax, new testbed

The June issue marks the end of the financial year and July heralds the introduction of the new GST. In July's issue, we will attempt to report both the GST prices and the former prices. From the July issue, the staff of the Test Centre will also be reporting additional results using new benchmarking software which is compatible with Windows 2000. Our product evaluation process will be adjusted to take into consideration the new benchmarks as well as market influence on the price of products. Notebooks already appearing in the Best Buys charts will be recalled for retesting. The new benchmarks will be PC WorldBench 2000 and SYSMark 2000 for testing application performance, while multimedia and 3D performance will be assessed using 3DMark 2000 and Video2000.



integrated CD-ROM drive, which lives in the Armada's MultiBay. This bay can be used to alter the functionality of the Armada M700 via its capability to house either a 24x CD-ROM drive, CD-RW drive, SuperDisk LS-120, 4x DVD, a second hard drive, a second battery, floppy drive or weight saver. TCO has also been considered, as the Armada M700 MultiBay options can be shared with other new Armada portables, reducing the total cost of ownership for customers.

Overall, the system is solid, well designed, performs well (238 in PC WorldBench 98) and offers diverse functionality while keeping TCO in mind, and is topped off by a three-year warranty. The only drawback is the floppy drive which needs to be attached externally to facilitate simultaneous floppy and CD drive functionality; otherwise, it is very hard to find fault with the Armada M700.

PROS: Lightweight, solid construction, integrated NIC and modem, overall quality

CONS: No simultaneous floppy drive and CD-ROM functionality

4 Acer TravelMate 734TL

This $6999 Pentium III 600MHz SpeedStep unit returned a PC WorldBench 98 score of 249. Featured is a 15in Active TFT display, 64MB of RAM, a 12GB hard disk and an 8MB graphics controller.

The 734TL weighs 3.2kg and seems a little bulkier than some notebooks, due in part to the 2x stereo speaker design on the top of the unit. The 24x CD-ROM and the 3.5in floppy disk drives work simultaneously, and the Li-Ion battery can charge in 3.5 hours.

You'll also find USB, a PS/2 port, one serial and one parallel port, S-video out, infrared, an external VGA port, a 10/100 Ethernet adapter and an integrated 56Kbps modem. Two Type II and one Type III PCMCIAs are supported. The touchpad controller feels solid, and dedicated scroll buttons are provided. The palm rests are generous and combine with a well designed keyboard.

4 Dell Inspiron 3800

The Inspiron 3800 is based on a SpeedStep 650MHz PIII processor and proved to be the new outright performance leader, returning a record PC WorldBench 98 score of 260 points. Configuration includes 128MB of RAM, 14.1in active TFT screen, an 8MB ATI Rage Mobility graphics controller and a 6x DVD-ROM drive. The 18GB hard drive provides storage and portable power comes from the nine-cell Li-Ion battery. Your $6181 investment also buys an internal 56Kbps V.90 modem, USB, TV-out, Type II and III PC Card slots and choice of colour. Dell has included both pointing stick and touch pad mouse devices, increasing ease of use. This system was configured with Windows 98 and ships with Microsoft Works Suite 99, as well as a leather carry case. The only drawback is that the DVD drive and floppy drive do not work simultaneously.

5 IBM ThinkPad 600X

The 2.25kg ThinkPad 600X shipped to us with a Pentium III 650MHz processor, 64MB of RAM, a 12GB hard-disk drive and a 4MB NeoMagic MagicGraph adapter, hooked up to a bright, crisp 13.3in active TFT display. The system also boasts a 6x DVD-ROM drive, stereo sound, integrated 56Kbps modem, Li-Ion battery and a host of software utilities and Lotus productivity applications.

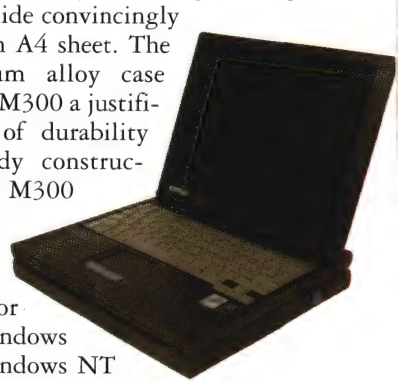
The system is solidly built and lightweight, with compact dimensions, and its battery life will not leave you wanting.

PC WorldBench 98 benchmark results were very impressive, the ThinkPad 600X returning a score of 255. Overall, the ThinkPad 600X impresses with quality design and construction, and delivers excellent performance. IBM supplied a recommended retail price of $8600 including a three-year international warranty.

VALUE NOTEBOOKS

1 Compaq Armada M300

NEW IT managers and frequently travelling end users alike should be pleased with the magnificently packaged $4416 Compaq Armada M300. The configuration of an Intel Pentium III 500MHz processor, 64MB of SDRAM, 6GB hard disk and 4MB SGRAM ATI LT Pro video controller produced very good benchmark results, including a PC WorldBench 98 score of 225. Standard features include integrated mini PCI modem/NIC combo, an 11.3in 800x600 colour TFT display, all standard ports including line-out headphone and microphone jacks, USB and infrared. There is also a four-cell Lithium-Ion battery and an external floppy drive. Performance is like that of a desktop system yet comes in a package that weighs 1.4kg and can hide convincingly behind an A4 sheet. The magnesium alloy case gives the M300 a justifiable air of durability and sturdy construction. The M300 includes the dual install option for either Windows 98 or Windows NT 4.0, a host of Compaq management tools and Fax Central for Windows 98 and NT.



In all, the M300 is an excellent ultraportable 2D system that has been designed with TCO in mind and is compatible with common Compaq options and docking solutions across

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its range. Some concessions have been made for this much portability and the four-cell battery is one of them, battling hard to provide an hour of portable life. The keyboard is 95 per cent of full size, yet there is no noticeable difference in functionality. In standalone mode it lacks a CD-ROM drive and stereo sound, which is rectified by the $595 Mobile Expansion Unit configured with CD-ROM, stereo speakers and another set of system ports. This bumped up the purchase price to $5011 yet still represents excellent value for money and, as such, the Armada M300 debuts in the number 1 spot.

PROS: Price, weight, performance, integrated modem+NIC, full complement of ports, build quality

CONS: Battery life

2 IBM ThinkPad iSeries 14AM

IBM has released this $2999 value-oriented notebook based around an Intel 466MHz Celeron processor supported by 64MB of SDRAM and a 6GB hard disk. This configuration led to its PC World Bench score of 186. The 13in passive display is powered by an ATI Rage Mobility M graphics controller, capable of a maximum resolution of 800x600. At 3.6kg and 43mm high, the 14AM is larger than some other notebooks.

Features include an integrated 56Kbps modem, and perhaps the best feature of this notebook — apart from its price — is the autonomous CD player and its external controls. Incorporating a one-year warranty and coming bundled with software such as The World Book Encyclopedia 99, Norton AntiVirus and Lotus SmartSuite Millennium, the IBM ThinkPad 14AM is ideal for anyone on a budget looking to enter the world of portable computing.

3 Compaq Presario 1200

NEW This entry-level offering from Compaq distinguishes itself from the rest of the notebooks in the Best Buys charts by being the only system based on AMD processor technology — and by having the lowest price in the chart, just $2799. The processor used is a 450MHz AMD K6-2 with 3DNow! technology. The rest of the specification includes 64MB of SDRAM, a 4MB Trident CyberBlade graphics controller and a 5.0GB hard-disk drive. This configuration returned similar performance results — 178 in PC WorldBench 98 — to portable 466MHz Celeron and 400MHz PIII systems that also appear in the Best Buys. The Presario 1200 has funky feel and its chunky form factor weighs 3.3kg, with dimensions of 50mm x 310mm x 256mm. Standard features include the 12.1in HPA screen, 24x CD-ROM drive, 1.44 floppy drive, integrated 56Kbps V.90 modem, one-touch launch Internet keys and JBL Pro Audio sound system. According to our tests, the NiMH battery provided a little over an hour of portable life. Standard connectivity is provided in the form of one parallel, serial, USB, PS2, VGA and PC Card interfaces, making it compatible with most devices.

A considerable amount of software is bundled and pre-installed in the form of MS Word 2000, MS Works 2000, MS Money 99, RingCentral Fax and McAfee Antivirus. There is also a recovery CD to get you out of trouble. The Presario 1200 ships with a one-year return to base parts and labour warranty

PROS: Price, modem, Internet keys

CONS: NiMH battery life

4 Dell Latitude LS

Packed within the tiny magnesium alloy confines of the 1.6kg Latitude LS lies a Pentium III 400 powerplant coupled with 128MB of RAM, a 6.4GB hard disk and a 2.5MB graphics adapter. It provides adequate performance for its purpose as an ultralight notebook with mainstream usability, returning a PC WorldBench 98 score of 185. Screen size is confined to 12.1in, while floppy/CD-ROM/DVD-ROM drives are accessed via an external smart bay that attaches to the rear of the notebook. Both a 56Kbps V.90 modem and a 10/100 Ethernet network interface adapter are integrated. Bundled software is excellent and includes Microsoft Office 2000, and other extras for your $6323 include a carry case and an international three-year next business day warranty. All up, a great buy for those looking in the ultra-light market.

5 NEC Versa Lite FX

The $6100 Versa Lite FX is an ultra-portable, sleek and light (1.54kg) consumer product with enough features to satisfy a much wider market. The Pentium III 500MHz processor is supported by 64MB of SDRAM (expandable to 192MB) and a 12GB hard disk. Using the 4MB Silicon Motion SM710 Lynx EM graphics controller, the 12.1in active TFT display is sharp, capable of 800x600 at 64K.

Built into just 24mm of height are three USB ports as a replacement for the serial and parallel ports that NEC has decided to omit. The docking ports allow for the 24x external CD-ROM drive and the external 3.5in floppy to operate at the same time. The in-built modem is accessible via the integrated RJ11 port and network connectivity is via a mini PCI LAN card with RJ45 connection.

The Versa Lite FX provides average performance, giving a PC WorldBench score of 202. It ships with such software as Microsoft Word 2000 and Norton AntiVirus, and includes a one-year return to base warranty with a three-year option. ■

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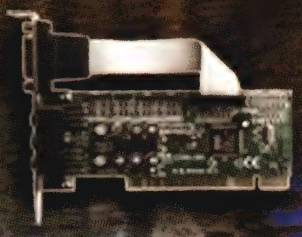
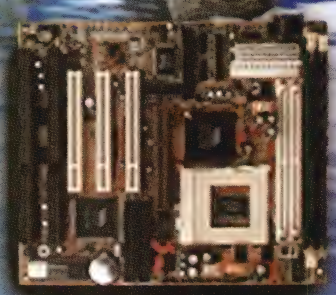
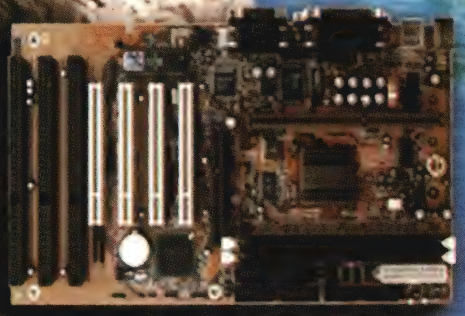


Eagle Sound Card



Eagle Super Socket 7 Motherboard



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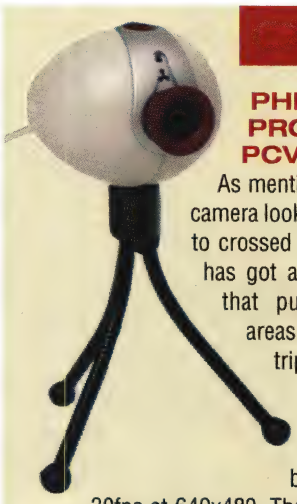
WEBCAMS best buys

Digital cameras aimed at Internet use have been around for a few years now. When PC World last looked at webcams, in December 1999, devices using a parallel port were the norm, and although USB (Universal Serial Bus) devices were in use, they were not as widespread as they have since become. The other alternative has been, and still is, PCI cameras. These cameras basically involve getting inside your computer to install a PCI interface card. The advantage is faster data rates, sharper pictures and the ability to connect to external video sources such as VCRs. The obvious disadvantage is the effort in setting up when compared to the true plug-and-play nature of USB. USB adds convenience and data transfer rates up to 5 times faster than its parallel counterpart. As webcams use a large data stream that is processed in real time, quality of video capture is largely dependent on the processor, RAM and graphics card. This is becoming less of an issue as modern consumer systems begin to reach over 1GHz.

Another step in the right direction has been the increased popularity in newer webcams of CCD (charged couple device) sensor technology. CCD has benefits over cheaper CMOS (complementary metal oxide semiconductor) sensors. For example, a CCD camera capable of 640x480 can provide up to three times the resolution and clarity of a CMOS camera capable of 352x288. Today, Windows 2000, in addition to Windows 95 (OSR2.1) and 98, incorporate USB support. With USB we are starting to witness the maturing of webcams in both ease of setup and video quality. In light of this, we have rounded up some of the latest units that let you send video mail, video conference or webcast images over the Internet. Our Test Centre hauled in 13 of the new breed of PC USB cameras, as well as a high-end network camera and a device that allows you to use your home movie camera as a webcam.



best buy

PHILIPS VESTA PRO PC CAMERA PCVC680K

As mentioned in the review, this camera looks somewhat like a potato crossed with a pear, but Philips has got a webcam on its hands that pulls features from all areas. It ships with its own tripod, can take 800x600 snapshots, incorporates a built-in microphone and a snapshot button, and is capable of 30fps at 640x480. The construction quality is solid and you really get the impression that you've got a fun little gadget in front of you that should last far longer than its one-year warranty. Although the software package is not as comprehensive as some other cameras, at an asking price of $199, this package remains good value.

Acer DVC-V6 Video Capture Kit

PROS: Good image quality

CONS: Can't capture in 640x480 at 30fps

The design of the Acer DVC-V6 is such that it can stand upright on a desk or fold flat so that it sits nicely over a monitor. A clip is provided for easy attachment to a notebook and the overall design is not as daunting to peer into as some other cameras we tested. Setup involved the installation of the camera drivers and the bundled software, which took little time or effort. Software can make or break a webcam package, and Acer has kept this in mind. Acer proprietary versions of EasyXpress for video mail, EasyAxess for video conferencing and EasyGuard motion detection software for security are comprehensive and easy to use. The camera can capture full motion video at up to 30 frames per second (fps) and can capture stills at up to 640x480 via its hardware snapshot button. Able to work well even in low light situations, image quality was clear and sharp; however, our panel did notice a blue tinge when trying to focus images up close.

Creative VideoBlaster WebCam Go

PROS: Great idea — combining a webcam and a digital camera

CONS: No flash, price

With the WebCam Go, Creative has cleverly combined a webcam and a portable digital camera in the one unit — it won't replace a dedicated digicam in terms of still image quality, but it is a nice touch. A see-through viewfinder is built into the unit, but an LCD viewfinder for the digicam mode has not been added. The LCD panel that has been included displays information such as frames left in the WebCam Go's 4MB onboard memory, which equates to approximately 200 still shots at 320x240 or 90 at 640x480. Two AAA batteries are included for when you get on the move. Camera modes include snapshot, webcam, time delay or multi-frame for mini movies. Image quality was found to be grainy but clear and vibrant. Software bundled is highly functional and easy to use. In addition to ArcSoft Polaroid PhotoMAX, Creative's own software for uses such as downloading stills from the camera works a treat. Still shots can be up to 640x480 and full motion video can be captured in up to 352x288.

BY DANNY ALLEN

Creative VideoBlaster WebCam 3

PROS: Functional and comprehensive software package

CONS: Snowy image

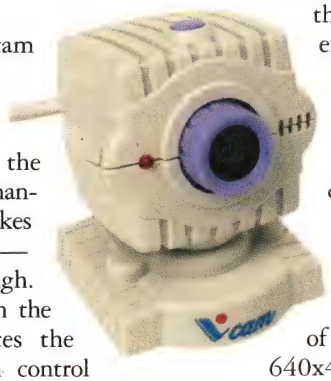
The second Creative webcam product in our charts is the update to the successful WebCam II — the VideoBlaster WebCam 3. Like the Webcam Go, the included manual is comprehensive but takes some concentration to follow — installation is a breeze, though. The software that comes with the WebCam 3 further enhances the value. The Creative webcam control and monitor utilities are brilliant for video capture and security motion detection use: you can be sent the image of an intruder via e-mail. A separate microphone is included and you are helped to set it up — clearing out background noise, for example, before using such applications as MS NetMeeting for video conferencing. Able to capture 30fps at up to 352x288 and take stills up to 640x480, the WebCam 3 has a nice moulded black design and feels solid. Image quality was clear and defined, but some noticeable pixel static occurred.

CU-99AC Digital PC Camera

PROS: Useful software package

CONS: Fluorescent lighting showed up extra bright even on fluorescent setting

Small and obviously aimed at desktop as well as notebook users, the CU-99 is able to capture 15fps at 640x480 or 30fps in up to 352x288. Shipping with a great bundle of software such as Gotcha for security, Ulead PhotoExpress for image editing and other software covering video mail and net conferencing, the CU-99 was a cinch to set up. Installation was a matter of plugging in the USB, waiting for Windows to detect the device, and selecting the driver CD-ROM to get the driver — voilà. The Windows CD isn't asked for, as is the case with most installations, and the whole process is explained in the quick start guide and on the users guide that comes as an Adobe PDF document. The hardware snapshot button works well — it's great to never run out of film. Stills up to 640x480 are possible; however, the camera had real problems capturing at that max specification even when using the bundled software provided. Like the Acer, a blue tinge is noticeable when focusing up close.

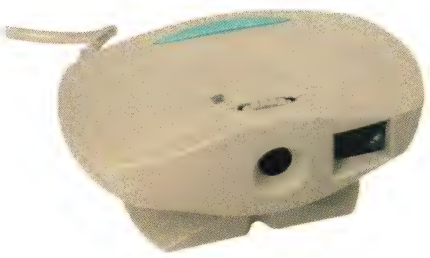


IVUCam Digital Camera

PROS: Camera-like design incorporating a viewfinder

CONS: Full motion video capture only up to 160x120

The image quality delivered by the IVUCam is one of nice colour contrast but with some moire patterning and blurring noticeable to our panel. Moire patterns, a kind of rippled wave-like clouding, occurred slightly in the vertical blinds in the room where testing was performed. The camera itself features in-built viewfinder, which works great with the hardware snapshot button to take still images up to 640x480. This, combined with the easy focus dial and the physical shape and design of the unit, begs for the happy snap-mad to make full use of it. Full motion video can be captured in up to 160x120 but 25fps can be achieved in 320x240. Among other useful software, the bundled package includes MGI products such as VideoWave II SE and PhotoSuite II SE.



webcam links

www.spotlife.com
Provides a free, easy way for you to make your images and movies available to the Web community.

www.camcentral.com/
Discover the voyeur in you and check out what other people get up to while online.

http://netconference.about.com
About.com's guide to Internet Conferencing.

http://surveyorcorp.com/webcam32/
An application for webcasting images to Web pages or FTP servers.

HOW WE TESTED

All webcams tested arrived in their full retail packaging complete with manuals, software and any bundled extras. Each camera was installed and set up in the same fashion that you would most likely do at home — using the software/driver CD's autostart facilities where possible. Video/audio conferencing, video capture, snapshot and webcam functionality were tested using supplied software where possible. Any previous camera installation or associated software was removed before each new webcam was set up. The Ease of Setup rating out of 10 was determined by setup time, ease of software, plug-and-play features and comprehensiveness of manual. Among other specifications, the Best Buy was evaluated on price, items in the bundle, ease of setup and image quality.

Test platform

The machine used in testing ran Windows 98 SE and was based around an Intel 810 chip set featuring a Pentium III 550MHz processor, 64MB of RAM, a 10.2GB HDD, CD-ROM and an on-board 4MB graphics controller. Resolution was set to each webcam's recommended or highest available setting using a 17in monitor with a Sony Trinitron CRT. Internet access was by means of a 10/100 Ethernet connection to the office network.

Image quality

Image quality out of 10 was evaluated by a panel of Test Centre technicians, editorial, production and art staff who ranked the webcams' still captures and saved video clips in terms of resolution, quality, colour, graining and other artefacting. Default focus, compression and colour settings were used where obvious focus/colour adjustments were not needed. All applications were closed before capture.

Lighting conditions

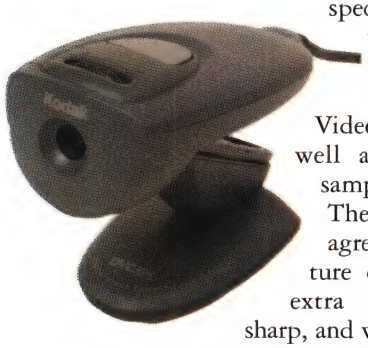
Our thanks to R Gunz Photographic, (02) 9935 6600, for supplying the Gossen Colormaster 3F used in our testing. Primarily used as a colour meter, we used the unit to measure the intensity of the ambient light in our testing area in lux (lx). This scale, used for measuring light levels, is mostly in terms of a footcandle's effect on a specified area in a completely dark room. The lower the number of lux in the specifications of a webcam, the darker the area in which it can operate successfully without graining or loss of image quality. Although the scale is not standardised between different manufacturers, the following comparisons we noted should adequately explain our testing conditions. The Colormaster returned between 25,000 and 40,000 lux when we took a measurement outside, on a clear, sunny day. The testing machine was situated under fluorescent lighting, with the webcam placed upon the monitor, partially facing a nearby window that let in plenty of sunlight. The lux reading in this setting was between 220 and 280. We felt this would be appropriate, as many PC users have their system in close proximity to such lighting factors.

Kodak DVC325 Digital Video Camera

PROS: True colour, sharp image quality, solid construction

CONS: Only handles full motion video (30fps) at 176x144

Like the Creative webcams, the Kodak's hard copy installation guide is nicely laid out. The fold-out takes you through the relatively simple setup, even reminding you to unplug the camera if you have plugged it in too early. Bundled software includes special Kodak versions of Presto! Mr Photo and Videoworks, as well as a games sampler pack. The panel all agreed that picture quality was extra clear and sharp, and with a bit of focusing, this was arguably the best image of all cameras tested. Higher resolutions did experience some frame dropping. Full motion video is up to 30fps at 176x144 or 25fps at 352x288.

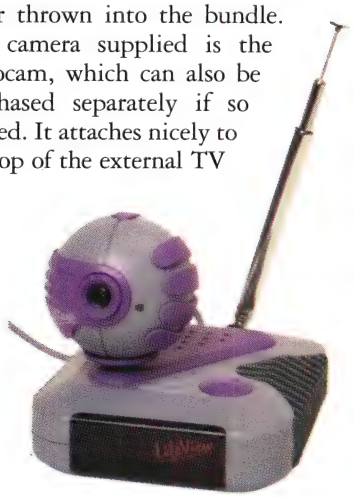


LifeTV Kit

PROS: All-in-one bundle

CONS: Jack of all trades — good at TV and webcam but not exceptional at either

The LifeTV Kit is a little more expensive than other items tested, but has the unique inclusion of a TV tuner thrown into the bundle. The camera supplied is the Robocam, which can also be purchased separately if so wished. It attaches nicely to the top of the external TV tuner unit and has an acceptable allowance of movement with room for adjustments. Despite its numerous connection cords, setup was easier than expected. Software included spans video conferencing, video mail and, of course, TV tuning. During testing of the latter, we tried both the included aerial and a proper rooftop aerial, and found that tuning was less than perfect. Each channel had a snowy quality. Able to take snapshots by means of its hardware snapshot button in up to 640x480, and to capture full motion video at up to 352x288, the Robocam provided a clean and bright image, but colour was not as vibrant as it could have been.



NOGATECH USB LIVE!

USB video capture adapter

Through its RCA video in, the Nogatech USB Live! II video capture adapter lets video cameras, camcorders, VCRs or TV tuners be connected to either a PC or a Macintosh for use with imaging applications to capture video at up to 30fps (frames per second). This allows you to stream video for video mail, video conferencing or even webcasting images that update as often as you like. Still shots can be up to 640x480. The adapter is small and ideal for portable use, with software-controlled pan and zoom functions incorporated.

Price: $299

Distributor: Micronica

Phone: (03) 9699 8844

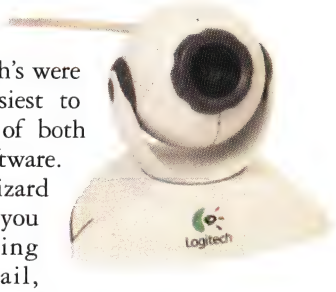
URL: www.micronica.com.au

Logitech QuickCam Pro

PROS: Incredibly easy to set up and use software, bundled microphone headset, 3m cord

CONS: Price when compared to competition

Of all the cameras we tested, Logitech's were by far the easiest to use in terms of both setup and software. One-touch wizard buttons guide you through setting up video mail, video capture and motion detection, setting up a webcam or creating a



AXIS 2100 NETWORK CAMERA

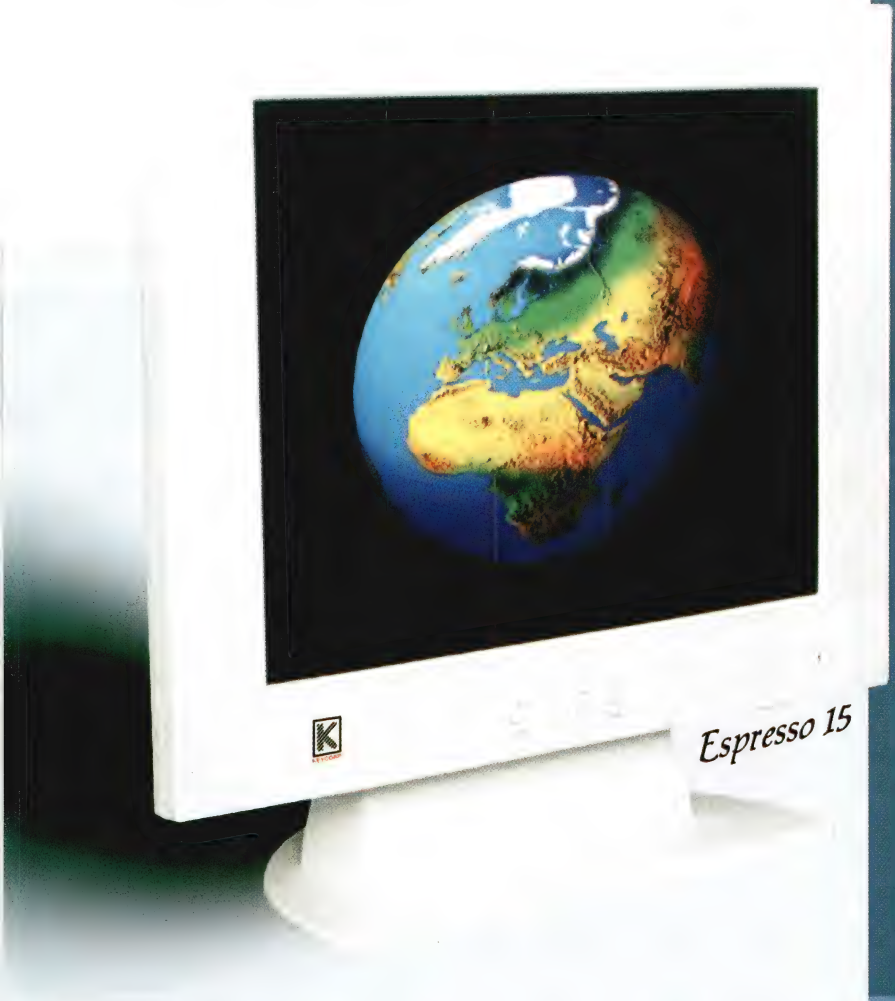
For those of you on fast connections such as cable or ISDN, and with money to spare — namely businesses — Axis has a family of Web cameras available. The 2100 Network Camera retails for $1150, comes with its own wall-mount stand and built-in http server to webcast images, and requires an IP address to be assigned to it. Connectivity is via an RJ-45 port directly into a local area network or directly into a modem (TCP/IP) — whichever is available. Two options are available for setup: either be guided through DOS or Unix commands, or download a Windows setup tool from Axis' site. The camera features a CCD sensor capable of 640x480 or 320x240 at up to 10fps.

Price: $1150

Distributor: Axis Communications

Phone: (02) 9967 5700

URL: www.axis.com



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snapshot/image gallery. As you can see from the picture, the famous eyeball design is functional, but a tad daunting to have pointing at you. A similar eyeball design is also used in the cut-down version — the QuickCam Express — available for $99. The Pro is a well-constructed unit that doesn't feel like it would break in a couple of months. You are also provided with a headset microphone and a long 3m USB cord in case you want your webcam away from the PC. Image quality is slightly blurry, with some slight moire patterning evident to our panel. We were unable to obtain stated specifications regarding 640x480 video capture, but our tests showed approximately 12.5fps at 640x480. Still shots are up to 640x480.

Logitech QuickCam Web

PROS: Incredibly easy to set up and use software, built-in microphone

CONS: Limited mounting possibilities

Featuring the same easy-setup software as the QuickCam Pro, the Web is the mid-range offering in the QuickCam family. With a different design and a hardware snapshot button, the Web can clip to monitors or notebooks with ease. Our panel felt that overall image quality was good and only slightly blurrier than the QuickCam Pro, which also uses a CCD sensor — making the QuickCam Web good value. As

Camera Name	RRP/ Warranty	What's In the Box	Recommended Minimum System	Ease of setup (marks out of 10)
Acer DVC-V6 Video Capture Kit	$199 1-year warranty	Acer EasyXpress software for video mail, video clips, etc. Acer EasyAxess software for video conferencing. Acer EasyGuard software for security – incl. alarms, motion detection, scheduling	Available USB port, Windows 98, Pentium II 166MHz with MMX, 32MB RAM, microphone and sound card, CD-ROM for software installation	8/10
Creative VideoBlaster WebCam Go	$319 1-year warranty	Installation guide, ArcSoft Polaroid PhotoMAX, WebCam Go control, WebCam monitor, Internet Explorer, MS NetMeeting, drivers for Windows 98, Creative MediaRing Talk 99	Minimum 166MHz (200MHz recommended) Pentium, USB, Windows 98, 16MB RAM, CD drive, 16-bit 640x480 display, 70MB hard disk space	9/10
Creative VideoBlaster WebCam 3	$139 1-year warranty	Drivers for Windows 98, detailed and friendly installation guide, great webcam control and monitor utilities for security use, Polaroid PhotoMAX, Internet Explorer with NetMeeting	Minimum 166MHz (200MHz recommended) Pentium, USB, Windows 98, 16MB RAM, CD drive, 16-bit 640x480 display, 70MB hard disk space	9/10
CU-99AC Digital PC Camera	$199 1-year warranty	Driver/software CD which includes on-screen installation guide, Grabbit/V-Grab software, MS NetMeeting, Ulead i PhotoExpress, Intercom Live Express, Gotcha security software	Windows 98, USB, Pentium CPU with MMX or MMX Instruction compatibility	8/10
IVUCam Digital Camera	$189 1-year warranty	Internet starter kit, installation guide, software/driver CD including Intercom Live Express, MS NetMeeting, MGI VideoWave II SE, MGI PhotoSuite II SE	200MHz Pentium, USB; Windows 95 (OSR2.1), 98; 16MB RAM, 2MB video memory, 640x480 display, 24-bit colour	8/10
Kodak DVC325 Digital Video Camera	$179 1-year warranty	Quick setup guide, users guide, software/driver CD featuring Kodak video software, MS NetMeeting, Presto! Mr Photo, Presto! Videoworks, games sampler pack	Pentium 166MHz with MMX or higher withUSB; MS Windows 95 (with OSR2.1+), 98; 16MB RAM and 150MB hard disk storage space, microphone, CD-ROM drive for software installation, 2MB video, 800x600 16-bit(thousands); PII 233MHz required for game pack; no Macintosh or Windows 2000 support at time of writing	10/10
LifeTV Kit	$399 1-year warranty	Robocam comes bundled (the same as can be purchased separately), LifeTV unit with built-in PAL/SECAM/NTSC TV tuner and video inputs, TV antenna, audio cable, user manual, driver CD including VideoLive Mail, Real Producer and Player, MS NetMeeting	Pentium II 166MHz with MMX or higher with USB; Microsoft Windows 95 (with OSR2.1+), 98 — online FAQ states Win2000 drivers to come; 32MB RAM and 10MB hard disk storage space, CD-ROM drive for software installation, 2MB or better SVGA display adapter	7/10
Logitech QuickCam Pro	$299 1-year warranty	QuickCam image capturing software, video mail, web page builder, webcam software, Digital Radar II video surveillance software, MGI PhotoSuite II SE, MGI VideoWave II SE, MS NetMeeting, Internet Explorer, Reality Fusion games, CrestaVideo greeting software	Windows 95 (Ver C or USB supplement incl.) or Windows 98, Pentium 200MHz MMX (266MHz recommended), USB, 16MB RAM, CD drive, 16-bit display, sound card and microphone for video conferencing	10/10
Logitech QuickCam Web	$199 1-year warranty	Camera base/mount, documentation, software/driver CD containing RealPlayer, Reality Fusion games, CrestaCards video software, MS NetMeeting, software webcasting, video conferencing, web page creation	Windows 95 (Ver C or USB supplement incl.) or Windows 98, Pentium 200MHz MMX (266MHz recommended), USB, 16MB RAM, CD drive, 16-bit display, sound card and microphone for video conferencing	10/10
Nogatech USB MicroCam	$397 1-year warranty	User guide, software CD which includes MGI Software, VideoWave SE, MS NetMeeting, Cu-SeeMe, camera driver floppy disk	Pentium 166MHz with MMX or higher with USB; Microsoft Windows 95 (with OSR2.1+), 98, 2000; 32MB RAM and 20MB hard disk storage space, 16-bit display, CD-ROM drive for software installation	6/10
Philips Vesta Pro PC Camera PCVC680K	$199 1-year warranty	Quick install guide, driver/software CD which includes VideoLink mail, PhotoExpress 2 SE, Media Studio Pro, MS NetMeeting	Pentium 166MHz with 16MB RAM and Windows 98 OR iMac 233MHz, OS 8.6 – both platforms will require free USB port; 10MB free hard disk space, 16-bit colour depth, CD/DVD drive for software installation, sound playback	9/10
Swann SmartCam Deluxe	$149 1-year warranty	Full version of Kai's SuperGoo, SmartCamWorks tutorial CD – full versions of Z-link video suite (Photo Magic, Photo EZ, Video CaptureManual), driver/software CD including Gotcha security, ICQ, Webcam 32, Paint Shop Pro, MS NetMeeting	Pentium MMX 200MHz or higher, 32MB RAM, USB, 80MB hard disk space, Windows 98	8/10
Swann SmartCam Professional	$199 1-year warranty	Full versions of MainActor, Kai's SuperGoo and PhotoSoap2, SmartCamWorks tutorial CD – full versions of Z-link video suite (Photo Magic, Photo EZ, Video CaptureManual), driver/software CD including Gotcha security, ICQ, Webcam 32, Paint Shop Pro, MS NetMeeting	Pentium MMX 200MHz or higher, 32MB RAM, USB, 80MB hard disk space, Windows 98	8/10

Extra Features	Interface	Image Sensor	Image quality as evaluated by panel (marks out of 10)	Frame Rate at Maximum Resolution as stated	Still Capture Resolution as stated	Full Motion Video (30 fps) Resolution as stated	Sensitivity To Light	Distributor
Well designed – stands on desk, attaches to a notebook or can be placed neatly upon monitor	USB (approx. 1.7m cable)	CCD	7/10	10fps at 640x480 (VGA)	up to 640x480	up to 352x288 (CIF)	stated minimum illumination level of under 10 lux	Servex Australia (02) 8762 3500 www.servex.com.au
Doubles as a portable digital camera complete with viewfinder and LCD panel displaying frames left in memory (4MB – approx 200 shots in 320x240). Able to switch between snapshot mode, single frame, time delay or multi-frame mini-movie mode	USB (approx. 2m cable)	CMOS	5/10	15fps at 640x480 (VGA)	Capture, still and digicam undocked modes: up to 640x480	up to 352x288 (CIF)	stated minimum illumination level of around 6 lux	Creative Labs Australia (02) 9666 6100 www.creative.com
Separate microphone included	USB (approx. 1.8m cable)	CMOS	5/10	15fps at 640x480 (VGA)	up to 640x480	up to 352x288 (CIF)	stated minimum illumination level of around 6 lux	Creative Labs Australia (02) 9666 6100 www.creative.com
Clip provided for attachment to notebooks	USB (1.8m cable)	CCD	4/10	10-15fps at 640x480 (VGA)	up to 640x480	up to 352x288 (CIF)	stated illumination range between 5-100,000 lux	AME Group Australia (02) 9749 9788 www.amegroup.com.au
Built-in viewfinder Focus wheel	USB (2m cable)	CCD	7/10	approx. 10-15 fps at 640x480	up to 640x480	up to 160x120 (QSIF) or 25-30fps at 320x240 (SIF)	not stated	VISION Beyond 2020 (03) 9558 0333 www.bc.com.au
Detachable mount, laptop mount, tripod allows for 70° of tilt movement, focus wheel	USB (3m cable)	CCD	9/10	8fps at 640x480 (VGA)	up to 640x480	30fps at 176x144 (QCIF) 20-25fps at 352x288 (CIF)	stated minimum illumination level of 200 lux. Comparatively, this may seem high, but camera adjusts in low light to give a better image	Kodak (03) 9353 2801 www.kodak.com.au
TV tuner bundled Macintosh drivers available	USB (approx. 1.7m cable)	CMOS	6/10	up to 352x288 (CIF)	up to 640x480	up to 352x288 (CIF)	stated minimum illumination level of 20 lux	VISION Beyond 2020 (03) 9558-0333 www.bc.com.au
Tilt swivel base with built-in clamp. Labtec headset microphone	USB (approx. 3m cable). Parallel version is available for same price	CCD	9/10	not stated	up to 640x480	up to 320x240 (SIF) or 25fps at 352x288 (CIF)	not stated	Logitech (02) 9972 3711 www.logitech.com
Built-in microphone, privacy shutter, focus wheel, attachment clip	USB (2.2m cable)	CCD	5/10	not stated	up to 640x480	not stated	not stated	Logitech (02) 9972 3711 www.logitech.com
Tiny Velcro footprint, USB bandwidth utilisation is adjustable, small, designed with notebooks in mind	USB (1.3m cable)	CCD	5/10	30fps at 352x288 (CIF)	up to 352x288	up to 352x288 (CIF)	stated minimum illumination level of 20 lux	Micronica (03) 9699 8844 or 1800 538 6000 to locate nearest reseller www.micronica.com.au
Tripod included Integrated microphone for digital USB audio recording	USB (approx. 1.9m cable)	CCD	8/10	30fps at 640x480 (VGA)	up to 800x600	up to 640x480 (VGA)	stated minimum illumination level of around 1 lux	Philips Australia 1800 658 086 www.philips.com.au/pcperipherals
Focus wheel, detachable tilt base	USB (approx. 1.4m cable)	CMOS	6/10	15fps at 640x480 (VGA)	up to 640x480	up to 352x288 (CIF)	stated minimum illumination level of around 5 lux	Swann Communications (03) 9421 2600 www.swann.com.au
Focus wheel, detachable tilt base	USB (approx. 1.4m cable)	CCD	6/10	15fps at 640x480 (VGA)	up to 640x480	up to 352x288 (CIF)	stated minimum illumination level of around 5 lux	Swann Communications (03) 9421 2600 www.swann.com.au

with the Pro, we were unable to obtain stated specifications regarding 640x480 video capture, but our tests revealed a capture rate of approximately 7.5fps. Additionally, you receive a built-in microphone and a hardware snapshot button to take 640x480 stills.

Nogatech USB MicroCam

PROS: Size, quality of bundled software

CONS: Can't capture in 640x480 at 30fps

Touted on its box as the lightest and smallest CCD camera in the world, the Nogatech MicroCam could easily fit in an adult's palm and is roughly the same size as X10's Xcam2 (**www.x10.com**), which at present isn't shipping to Australia. Able to capture full motion video and still shots at up to 352x288, the camera's compression allows for USB bandwidth adjustment if you have several USB devices connected to your computer and need to obtain maximum capture performance. Shipping with MGI Video Wave SE for video editing and a collection of video conferencing software, the camera was easy to set up via the 3.5in floppy driver disk. The drivers did cause the test machine to crash several times — downloading version 1.84 from Nogetech's Web site (**www.micronica.com.au**) fixed that. Our panel noted that image quality was a tad grainy and lacked colour vitality, and overall had a slight fish-eyed lens or barrel-distortion look to it.

Philips Vesta Pro PC Camera — PCVC680K

PROS: 800x600 snapshot capability with hardware snapshot button, 640x480 at 30fps, nice tripod

CONS: Software is good, but could be better

About $40 more than its lower specified sibling and looking like a cross between a potato and a pear, the Vesta Pro comes with a nice tripod as well as bundled software such as Media Studio Pro. Using Ulead PhotoExpress 2, another item in the value pack bundle, I captured stills at 800x600 — an ability that only this camera can boast. Backlight compensation improves image quality in an area with high levels of light. Using VideoLink e-mail was simply a matter of clicking record, playing back what has been recorded and than clicking on mail; it then attached itself to an Outlook Express e-mail document, ready to be sent. Our panel felt that the Vesta Pro was able to capture clear, vibrant but slightly pixelated full motion video at 640x480 with no hassle.

Swann SmartCam Deluxe

PROS: Great software

CONS: Lightweight construction

Almost identical to its siblings in more than just its shape design, this unit's software was relatively easy to use, but some problems occurred. It took two attempts to install when following the instructions exactly, but, in the end, all was set up with little hassle.

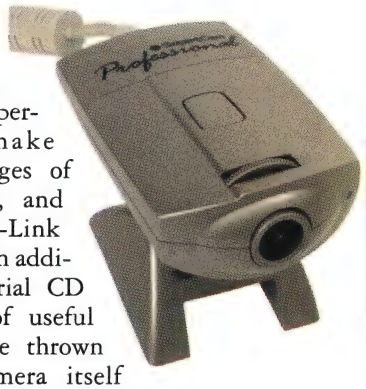
The Deluxe covers the ground between the Swann SmartCam Personal, $99, and the Professional models — and does so nicely, being able to capture full motion video at up to 352x288 and still shots at 640x480. In 640x480 you can capture video at 15fps. Image quality was high but our panel felt it suffered from some flickering and colour banding.

Swann SmartCam Professional

PROS: Terrific software bundled, including some full versions

CONS: Lightweight construction

The Swann SmartCam Professional comes with an exceptional amount of bundled software, including full versions of Kai's Super-Goo to make warped images of your family, and also the Z-Link video suite. In addition, a tutorial CD and loads of useful shareware are thrown in. The camera itself looks classy but feels slightly frail. It's capable of capturing 30fps in up to 352x288 and still images at up to 640x480. The drivers worked well, covering the standard gamma, sharpness, contrast and office fluorescent lighting settings. Image quality was judged by our panel to be clear and sharp.



However, they did notice some contrast changes and flickering around moving objects. Some edges appeared slightly pixelated around the edges but, overall, this is a nice camera package. ■

AXIS 2100 NETWORK CAMERA

No need for a PC

WWW SERVER BUILT IN

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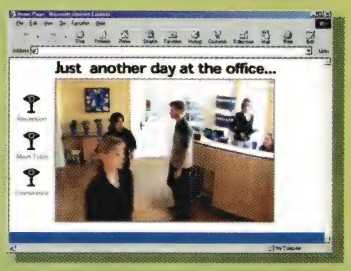
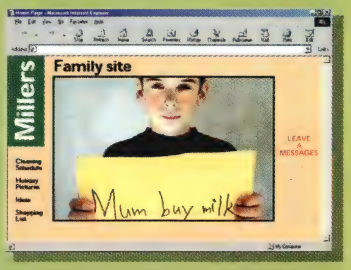
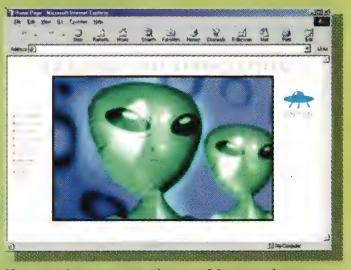
- ☑ Compatible with operating systems such as Windows 95, Windows 98, Windows 2000, Windows NT, Linux and Mac.
- ☑ Works great with high-speed internet access such as DSL or cable modem as well as a standard modem.



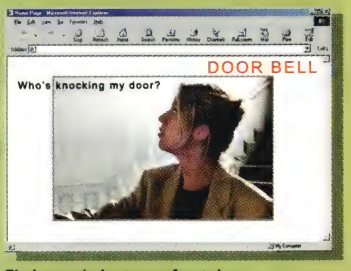
Where's everybody hiding out in the office? Great for LANs or as a part of your web site.



Cut distances and come closer to relatives and friends. Whenever they are. Happy birthday...



Keep a close eye on the world around you. Or show your part of it through the Web.



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Sun's StarOffice 5.2 beta

This month, LinuxWorld.com.au reviews the beta release of Sun Microsystems office suite, StarOffice 5.2. Available free by download from Sun's Web site (www.sun.com/staroffice/), StarOffice is a cross-platform, total office product that runs on Windows (9x/NT/2000), Linux and Solaris. The StarOffice suite is ideal for the home and business user, and this new Beta focuses on compatibility with Microsoft Office 2000 and improved ease of use. General additions to the suite include the ability to spell-check up to 20 languages, easier file navigation and a faster and more stable environment.

StarOffice is easy to set up and occupies about the same amount of disk space as Microsoft Office 2000 Standard. For Linux, a Pentium computer with at least 32MB of RAM is required. We tested StarOffice on a Pentium 200MHz with 32MB of RAM, running RedHat 6.2. Performance was acceptable, but 64MB of RAM is advised.

A command window at start up allows for any kind of document to be created (see FIGURE 1). For additional functionality, StarOffice can be integrated with your desktop environment to allow you to access other Linux commands from within the suite.

The word processor, StarOffice Writer, is everything you would expect from a standard authoring tool. The application has its own native format, but working with Microsoft Office Word documents is very smooth. The layout is clean, but it may take time for Microsoft Word users to adjust, for many of the commands are less obvious.

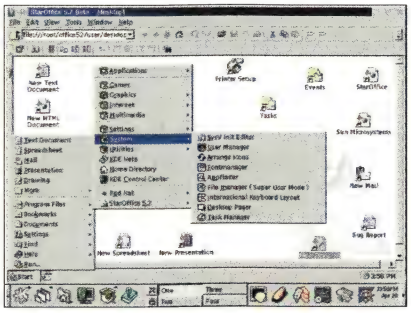

FIGURE 1: The main command window.

StarOffice Calc, the spreadsheet application, has improved filters for working with Microsoft Excel spreadsheets. Other improvements include DataPilot table features and improved hyperlink handling and export capabilities. A new currency conversion AutoPilot will convert currencies in documents to and from many European currencies. The AutoPilot tool works across the entire suite and can be applied to guide you through such processes as creating letters and tables and applying mathematical functions.

Presentations and large display graphics are handled by StarOffice Impress. This is compatible with Microsoft PowerPoint, although it is not as user-friendly as that software when it comes to modifying an existing presentation. Impress has some new useful features — such as the StarOffice Player — that can be installed to run StarOffice Impress on computers without the entire suite. The Webcast support utility will allow you to export a presentation to be delivered as a webcast using Perl or ASP scripts. A new compression utility means presentations can be compressed and saved across multiple disks.

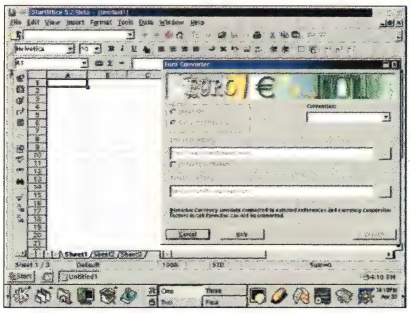

FIGURE 2: StarOffice AutoPilot allows easy currency conversion.

In addition to the standard office tools, StarOffice incorporates drawing and chart applications as well as an e-mail client. The suite has a Web page creation tool similar to Netscape's Composer. There is also a scheduling and task manager program, for which improvements include support for drag-and-drop moving of appointments and more e-mail reminder options. The database application included is called StarOffice Base: it has the new Adabas D database engine, which can be downloaded separately. Improvements to this include the ability to front-end Microsoft Access 2000, Oracle and SQL servers. ODBC 3 is also supported.

The download itself will take a while, with the single file for Linux being approximately 90MB. The StarOffice 5.2 Beta release is a functional cross-platform productivity suite that's easy to use. Compatibility with Microsoft Office 2000 is definitely one of its strongest attributes. If you're looking for an office suite for Linux, then StarOffice 5.2 — due for final release by the winter — is certainly worth a try. ■

RODNEY GEDDA

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ON THIS MONTH'S COVER CD-ROM:

This month's CD features a complete release of RedHat Linux 6.2 — the world's most popular Linux distribution. New features in this release include a much easier installation process, a more robust X Windows configuration tool and better applications for large-scale data storage. Important upgrades for system libraries and popular applications like the Sendmail e-mail system and the Apache Web Server have also been included.

Check out the upgrader section of Here's How on page 114 to see how you can install RedHat 6.2 with BeOS and Windows 98, all on the same machine.

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Multihead in X

Multihead is a relatively new feature in XFree86 and allows a user to run two or more monitors simultaneously while in X. This has been possible since XFree 3.3.x, but has only become particularly useful in the newly released XFree 4.0 (see May's PC World CD). XFree 4.0 adds a feature called xinerama, which allows the user to stretch the desktop across multiple monitors.

How does it work and how do I do this?

You will need to have installed the latest version of XFree (currently 4.0.0), from the May CD or **www.xfree86.org**. You will also need at least two supported video cards and, obviously, two monitors to go with them. Note that the Matrox G400 dual-head is not currently supported in Multihead: only one output will be used on this card. You will also need to know the hardware addresses of each card (each card's irq).

A good start to getting Multihead working under X is to generate a configuration file using the "xf86config" utility provided with X. This should save a configuration file called XF86Config in /etc/X11 and it is this file that you will need to edit.

Once you have opened /etc/X11/XF86Config in your favourite text editor, you can skip to the section starting with "Section "Monitor"". It is here that each monitor is configured. If both your monitors are the same, you need not worry about this. If, however, they are different, I would advise you to copy this section entirely, giving the second section a different Identifier tag and entering the relevant information about your second monitor. Your monitor sections should look something like FIGURE 2.

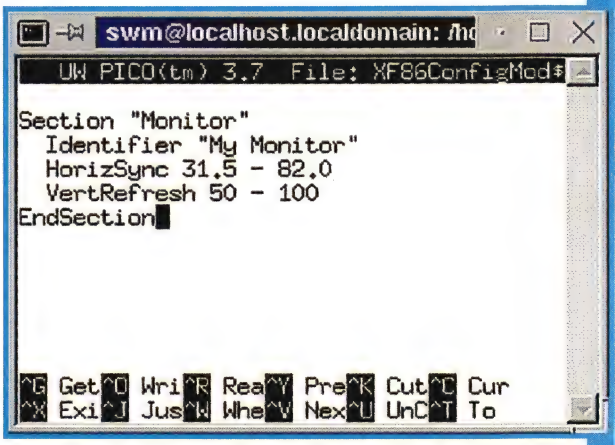

FIGURE 2: Section "Monitor" is where each monitor is configured.

Next, you will need to add another device for your second video card. To do so, skip forward to the section starting with "Section "Device"". Once again, you will need to copy this section for each card in your system. Each card has its own driver and you will need to look up the driver for your second card from **www.xfree86.org/4.0/manindex4.html**. You will also need to specify the amount of VideoRam for each card and its BusID. The BusID is simply the hardware address of the card in question and is in the format "PCI:bus: device(irq):function". Note that PCI changes to AGP (accelerated graphics port) for an AGP card.

The relevant bus/device/function numbers can be found by looking at /proc/pci and are listed in a similar format. This is shown in FIGURE 1.

Once you have done this you will need to skip further ahead to "Section "Screen"". You will again need to copy the entire section, giving the second a unique identifier and changing any resolutions to suit your second monitor's needs.

Please note that Multihead requires that both screens run with the same colour depth; however, resolutions on each screen can be different. The second screen section will also have to refer to your second device's identifier, not the first.

The final section in XF86Config is the ServerLayout. Here, you define where each of your screens is located on your desktop. The most common layout is shown in FIGURE 3.

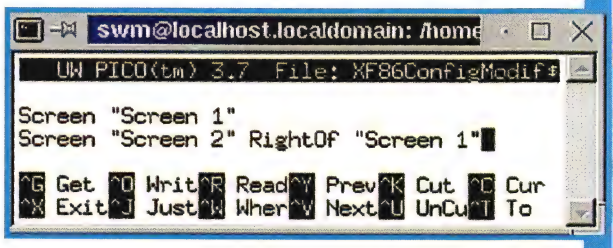

FIGURE 3: Defining your screen location on the desktop.

The final part of using Multihead under X is to actually start X. You will need to add "+xinerama" to your X startup line to start xinerama, otherwise, your desktop will not stretch. For example, I start X using "startx +xinerama". It is also possible to add this to your XDM configuration if you use XDM. ■

ALASTAIR COUSINS

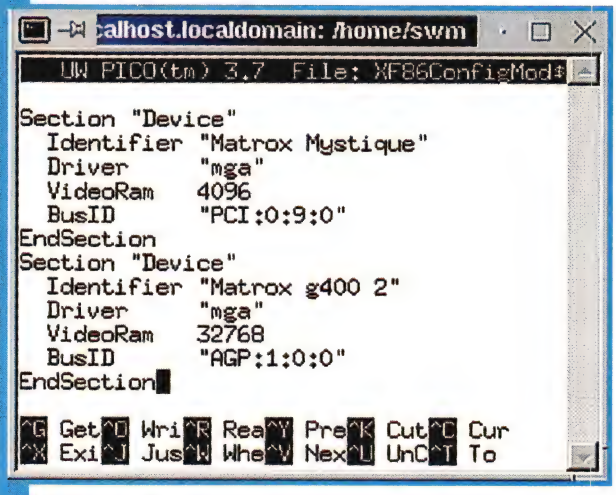

FIGURE 1: Adding another device for your second video card.

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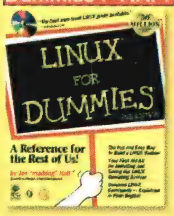

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A Reference for the Rest of Us! The Fun and Easy Way™ to Build a LINUX System.

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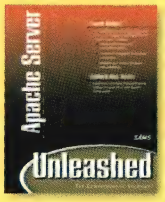

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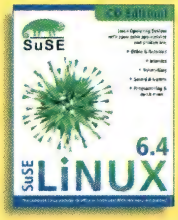

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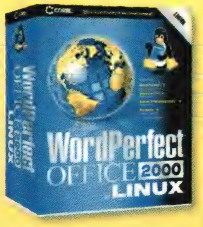

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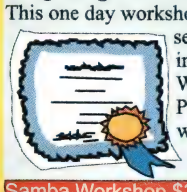

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Beowulf: a new approach to supercomputing

What do you get when you cross off-the-shelf hardware and Linux? You get a powerful, highly standardised supercomputer called Beowulf. And you get it cheap. The University of Tennessee and Oak Ridge National Laboratories built a Linux supercomputer for free! (Check **http://stonesoup.esd.ornl.gov** for details).

The key to this kind of bargain-basement supercomputing is tying standard PCs together with Linux. The combination of low-cost, universally available source code and the open source development model that Linux offers makes it practical to build high-performance computers cheaply.

Linux also offers a way around the software bottleneck that has plagued supercomputers for years

Don't think that using standard processors is limiting. The current supercomputer champ, ASCI Red at Sandia National Labs, uses 9632 Intel processors to crank out a 2379.6 on the standard Linpack Rmax benchmark.

The reason these systems are so effective is that there are a great many very big, very complicated problems that naturally break down into iterations of the same, much simpler, problem. That describes everything from forecasting the weather to doing computer animation to running large, computationally-intense business applications. While the parts of the problem may be mind-numbingly complex by human standards, the processor in even a $2000 PC can handle them without breaking a sweat. If you can divide the project among multiple processors and let them work on their parts at the same time, you can reduce enormously the time it takes to get a solution.

An example of a Beowulf cluster of rack-mounted machines, developed by LinuxNetworX, Inc.

Some problems, by their nature, don't divide into chunks that you can parcel out among processors. And there are others whose chunks are too large to run on a single microprocessor, or even an SMP (symmetrical multi-processing) cluster. Tasks which require very large amounts of traffic between each node (more, say, than 2Gbit/s) are also unsuited to Beowulf design at present, since the network connecting the machines will necessarily determine the maximum amount of data each node can receive or transmit.

A Beowulf-class computer is now a recognised designation in the supercomputer community, and the list of such computers is up in the hundreds and growing every day. For an in-depth analysis of the type of Beowulf machines, and the software that is now being put together to run them, go to the Enterprise section of **LinuxWorld.com.au**. ■

RICK COOK

eComWorld

THE E-COMMERCE GUIDE FOR SMALL & MEDIUM BUSINESS

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JUNE 2000

The simple guide to getting your business online

For existing businesses & online entrepreneurs

Stage 1: How the Internet works for business

Stage 2: Why did you decide to take the plunge?

Stage 3: Work with the experts

Stage 4: Strategy, strategy, strategy!

Stage 5: Internet technology enabling your business

Stage 6: Building an information site

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next month:

building your customer service and e-commerce site

INTRODUCTION

eComWorld is designed to help small and medium businesses join the online economy. Our goal is to help 2001 businesses start online ventures by 2001.

In its infancy, the Internet was the domain of the technically elite. Internet use — spurred by the invention of the World Wide Web in 1989 by English engineer Tim Berners-Lee — is now widespread through the population. Worldwide connectivity has managed to span socio-economic, age and gender groups.

Now the time of widespread adoption of e-commerce has arrived. IDC predicts that Internet commerce will double every year for the next three years, spurred by growth in business use and supply chain expenditure as well as major jumps in personal online spending. And if you do business with the government, being online is a future necessity.

But how do you get there?

We are now entering a period in the Internet's history where small and medium businesses can take advantage of the technology that has long been beyond their grasp. However, understanding how to take advantage of that technology is one roadblock that must be overcome.

Every month, eComWorld provides a stage-by-stage process to getting your business online. The articles follow a logical progression from understanding concepts — with only the jargon you need to know — to building your site.

This launch edition takes you through the essential background information to online business including helping you develop your online strategy and build the most common of corporate sites — the information site.

We've also put together a range of useful information on our Web site http://ecomworld.com.au including relevant news, reviews and tutorials as well as an online feedback form where you can register suggestions and ask questions.

Finally, to ensure we can measure the progression towards our goal, we'd like you to register your Web site with us. We'll be providing an online directory — categorised by industry and business type — for our readers and consumers alike.

To register your site, just go to http://ecomworld.com.au and follow the links to the eComWorld directory form. ■

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How the Internet

The Internet works for business in the same way that the telephone does: it makes it easier to communicate with people.

BY GRANT BUTLER

Using the Internet makes it much easier for you to sell to customers here in Australia and even overseas. Depending on what you sell, particularly if it's something that can be delivered electronically like information or music, you might be able to deliver it at almost zero cost regardless of where the customer lives.

There are many celebrated examples of this at work, from Amazon.com to Tim Fischer's beloved Mick's Whips in outback Northern Territory and Perth's naughty Adultshop.com.

As a nation, we're taking to 'e-tailing', according to a new report by Boston Consulting Group. The study found that Australians bought $600 million worth of goods over the Internet last year, or an average of about $30 worth each. In Japan the figure is $2.4 billion, or $20 each, and in the United States it's almost $60 billion, or $160 each.

However, the Internet is a double-edged sword. Yes, it makes it easier for you to communicate with existing and potential customers. However, it also makes it easier for your competitors to reach your customers. Sydney bookshop Gleebooks is just one of many thousands of stores worried that Amazon, which doesn't even have an office in Australia, is our most popular electronic commerce site.

Worse, the Internet makes it easier for customers to reach your suppliers. If you're a middleman, you could be cut out of the loop.

Dell Computer has made a $40 billion-a-year business out of selling made-to-order computers directly to customers, almost half of which are sold via the Internet. Chief executive Michael Dell has claimed that his company took in 88 per cent of all profit made in the PC industry worldwide in 1999.

That's bad news if you own a computer shop.

What makes Dell significant is not that people can buy computers through its Web site. What makes it a powerhouse is that it's used the telecommunications network, upon which the Internet is one of many applications, to drive efficiencies throughout its business. Dell doesn't make a computer and then hope you'll buy it. It asks you what sort of computer you want, then, if you're Australian, whips it up in Malaysia and sends it down. It can do this using a call centre or an Internet site.

works for business

nternet works for business How the Internet works for business How the Internet

It also has all the companies that make the parts for your computer interacting with it online in a very slick, just-in-time manufacturing process. The economy of this approach means customers persevere, even if, like this writer, they encounter bugs in the Dell Web site!

RISING PRESSURE

Pressure is forming for companies, large and small, to find ways to use the Internet to become more efficient. Within three years, the Federal Government and most state governments will require all suppliers to trade with them electronically. Everything from tendering to submitting invoices will have to be done via the Internet.

Such so-called business-to-business electronic commerce is already much larger and better known than business-to-consumer trade. According to IDC, B2B e-commerce will outstrip B2C by a ratio of 8:1 by 2003.

Global imaging company Kodak has said that it plans to cut $US1 billion from the $US7-8 billion it spends each year with more than 5000 individual suppliers. It plans to achieve this over three years by making the companies interact with it electronically and reducing its suppliers to 2000. If it goes the way of Ford and other large companies, it may also force them to compete for its business in transparent online markets like AutoXchange and Freemarkets.com that brutally expose profit margins.

In other words, if you're not online within a few years, chances are that you won't be part of the economy.

AROUND THE CORNER

The Internet of today is a slow, cantankerous version of what's coming. Delivery technology such as cable modems, ADSL (asynchronous digital subscriber line), satellite and third-generation mobile phone networks will combine with ever more powerful computers to make the network fast and highly available.

ADSL will deliver 1-2Mbps per second over normal copper phone lines (about 50-100 times faster than a conventional modem). Companies such as start-up Access 1 and pay TV provider Austar, in partnership with Europe's Chello, plan to let you download streaming video, software and other material by satellite and wireless at around 1Mbps.

AAPT will this year launch a high-speed wireless service with the sexy title of LMDS (local multipoint distribution system) to provide business customers in suburban business centres with high-speed, low-cost data access.

The mobile phone network operators Cable & Wireless Optus, Telstra and Vodafone are also ramping up their networks and, in March, Hutchison Telecoms and One.Tel paid a staggering $670.9 million and $523.1 million, respectively, for 15-year licences for spectra in the 1.8GHz frequency band.

The existing and new carriers plan to roll out '3G' networks that will, in theory, allow you to access the Internet at 2Mbps through your mobile phone and other devices. Usage of these networks will be charged by the byte of data used rather than time.

This new high-speed infrastructure will be complemented by new security devices, from smart cards to finger scanners, and micro payment systems that increase the usefulness of the network.

The result should be that not only will the Internet be fast, it will be always on and always available through a plug in the wall or the air around you.

It's no exaggeration to say that you will live within the network. In fact, if you own a mobile phone, you already do. Not only that, a whole new generation of consumers will have grown up with the Internet as a part of their daily lives.

FIND A HOME IN CYBERSPACE

With such a dizzying array of opportunities, threats and possibilities, it's hard for most business people to know where to start. A good place to begin is to find an address in cyberspace – known as a 'domain name'.

The domain name system serves to translate 'real' Internet addresses – strings of numbers that show the location of a computer on the Internet in much the same way as numbers show lines on the telephone network – into words that people will find easier to understand.

This means that instead of typing in numbers you can type in names, such as 'Netscape' or 'ecorp'. For a demonstration, type 203.34.46.64 into a Web browser and you'll end up at the Web page for PC World (pcworld.idg.com.au).

To differentiate between companies, government agencies, non-profit organisations and Internet companies themselves, the founders of the Internet also added suffixes, such as '.com' to denote commercial organisations. They also added country codes, such as '.au' for Australia, to indicate if a computer was located outside the United States.

The table at right shows the common domain name suffixes, country codes and their meanings. One confusing factor, however, is that over time many non-US companies now use '.com' and other US names and many commercial organisations now use '.net' addresses. For instance, TopJobs.net is a European job search Web site.

The result is that the American .com, .net and .org names are, *de facto*, becoming 'global', while many organisations within countries are seeking to use specific country domains to indicate to customers where they are.

Due to its unique Internet management system, Australia has extended the number of domain suffixes to make it easier for people to obtain the name they want. However, due to a policy decision, we don't allow the registration of generic domain names such as 'doctor' or 'tax'. (See tables at right for additional information.) ■

Grant Butler is joint managing director of Sydney-based Editor.com (www.editor.com). Editor.com assists companies in producing high-quality sales literature, Web sites, reports and other written material.

Checklist

CHECKLIST ITEM	HELPFUL RESOURCES
Choose a name	Your name can only be up to 63 characters in length, including suffixes. Keep in mind the difference between .com, .net, .org and other names (see listing below).
Check if it's available	Check ine.com.au for Australian and US names; netregistry.com.au for those and some international names, including NZ and UK.
If not, find out whether the owner will sell	To discover who owns a domain name you need to search a country-specific 'Whois' database. A quick way to do that is to go to netregistry.com.au and search for a name. If it's taken, NetRegistry will automatically give you the owner's details, including an e-mail address. Otherwise, see auric.net for details on Australian names and networksolutions.com for US names.
If they'll sell, how much should I pay?	There are no rules, but to see the prices being asked and paid see broking and auction sites such as greatdomains.com or ebay.com.au. Or, search Yahoo.com for a list of 'domain name brokerages'.
Delegate the name	You will need to 'delegate' your name to a name server – a specific computer on the Internet that knows where to find your Web site – when you want to start using it (and, in some countries, even before). Follow the instructions at the domain name registrar's Web site or ask the company that will host your Web site for help.
Action!	Once you've had your name delegated and Web site produced, you're ready to go live on the Net!

DOMAIN NAME TYPE	MEANING
.com or .co	Commercial organisations
.net	Internet services companies
.org	Non-profit and some other affiliated organisations
.edu	Educational institutions
.gov	Government agencies

AUSTRALIAN DOMAIN TYPES	RESERVED FOR
com.au	Commercial organisations
net.au	Internet services companies
edu.au	Educational institutions
org.au	Non-profit and affiliate organisations
gov.au	Government agencies
asn.au	Associations
info.au	Major information providers
oz.au	Australian Computer Society use only
id.au	Individuals' names
conf.au	Conferences

INTERNET TECHNOLOGY FAST FACT

Secure Sockets Layer, or SSL, technology enables you to ensure that data such as credit card details cannot not be intercepted as it is transferred from a customer's PC to the server housing your Web site. Most people use 40-bit encryption, a basic level of SSL security that works in Netscape and Microsoft browsers up to Version 4. Later browsers, released after 1999, support 128-bit encryption, which is trillions of times stronger. See ssl.com for more information.

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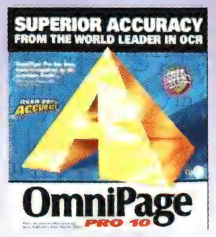

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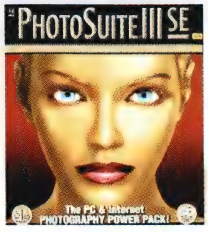

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Why did you decide to take the plunge

Why did you decide to take the plunge? Why did you decide to take the plunge?

Electronic commerce can be used as a tool to grow businesses. It opens up a new window of opportunities. By employing the opportunities provided by the Internet and electronic commerce, large businesses as well as small and medium-sized businesses can benefit tremendously.

Cybershoppers

- Australians who frequently shop online are on average 25-35 years old, and are highly educated, early adopters of the Internet. They're typically in professional occupations.
- In the 12 months to June 1999, approximately 48 per cent of regular Internet users had shopped online at least once.
- Australian shoppers spent some $920 million online in 1999, including approximately $150 million on Christmas-related shopping. Books, non-educational software and music are the three most popular product categories.
- "Today's online shoppers are early adopters, adventurers and experimenters. Both buyers and sellers will have to expand their frontiers and explore new modes of commercial functionality on the Internet, because the task of converting Internet users into online shoppers is clearly not to be underestimated." – *Richard Sandlant, Director of E-Commerce and Online Shopping*

Source: http://www.consult.com.au

BY TAMARA GINIGE

CHANGES IN BUSINESS ENTERPRISES

During the past few years organisations have become dependent on information technology (IT) for doing business. The Internet and other online technologies have enabled business professionals to do their jobs better, faster, cheaper and more efficiently. The advancement in the telecommunications industry has provided organisations with networks such as the Internet, which has enabled business communities to interact and share information. Changes in IT have helped business communities to store, process, retrieve, access and analyse their business information in a better way.

As a result, there have been major modifications in business-to-business relationships, customer-to-business relationships and internal business processes. As you would expect, large businesses have eagerly adopted these changes. However, small and medium-sized organisations can also afford to alter their business enterprises and enjoy the benefits.

WHAT IS ELECTRONIC COMMERCE?

Electronic commerce has been a buzzword for the past couple of years. Every organisation is thinking about how it can at least have a Web presence. Organisations that already have a Web presence are thinking about the next step – transactions over the Internet.

Electronic commerce can be defined as the use of electronic data transmissions to enhance business processes. This includes buying and selling, advertising, delivering goods and customer service. When implemented properly, and when aligned with overall corporate strategies, electronic commerce can significantly enhance the operations of an organisation. This in turn will benefit the customers, the government and the economy. Large businesses such American Airlines, General Electric and Boeing, and small businesses such as Boots Online (http://www.bootsonline.com.au) and 1-800-FLOWERS (http://www.1800.flowers.com), which had traditional businesses, today have successful Web-based strategies. This is challenging many traditional companies to rethink the way they conduct their business.

ADVANTAGES TO THE ORGANISATIONS

Organisations – small, medium and large – are interested in electronic

into e-commerce?

E-Commerce impact on various distribution costs, US$ per transaction

	Airline tickets	Banking	Bill payment	Software distribution
Traditional system	$8.80	$1.08	$2.22-$3.32	$15.00
Telephone based		$0.54		$5.00
Internet-based	$1.00	$0.13	$0.65 - $1.10	$0.20 - $0.50
Savings (%)	87%	89%	71% to 67%	97% - 99%

Source: OECD 1999, The Economic and Social Impacts of Electronic Commerce: Primary findings and research agenda.

commerce for several reasons. One of the main ones is that electronic commerce can help increase sales and thus profits. Electronic commerce helps small and medium-sized organisations reach a global market that would otherwise be inaccessible. With minimal capital outlay, a company can easily and quickly locate more customers, potential suppliers and interested business partners, nationally as well as internationally. For example, in 1997, Boeing Corporation reported a saving of 20 per cent after a request for a proposal to manufacture a subsystem was posted on the Internet. A small vendor in Hungary answered the request and won the electronic bid. The subsystem was cheaper and was delivered quickly.

The second reason is that electronic commerce can significantly reduce the cost involved in paper-based transactions, such as those of creating, processing, distributing, storing and retrieving. It can also reduce the costs involved in handling sales inquiries, providing price quotations and determining product availability. General Electric is a classic example. In 1997, General Electric started business on the Internet (http://www.ge.com). That year, it purchased approximately $1 billion worth of supplies using the Internet. It reported a 30 per cent reduction in processing costs. Another good example is Cisco Systems (http://www.cisco.com). In 1998, Cisco made 72 per cent of its sales on the Internet. There were no customer-service representatives involved in those sales. Therefore, Cisco Systems estimates that it avoided handling 500,000 calls per month, saving over $500 million that year.

The Internet is also a breakthrough for advertising. Organisations can promote themselves to potential customers all over the world. Specialised businesses that are geographically scattered are brought within reach. Using the Internet, it is easy to create virtual communities based on a common business interest.

> "THE REAL POWER OF TECHNOLOGY (SUCH AS E-COMMERCE, TELECOMMUNICATIONS, TECHNOLOGY SERVICES OR MULTIMEDIA) IS NOT THAT IT MAKES THE OLD PROCESSES WORK BETTER, BUT THAT IT ENABLES ORGANISATIONS TO BREAK OLD RULES AND CREATE NEW WAYS OF THINKING – THAT IS, TO RE-ENGINEER."
>
> *M Hammer and J Champey, Reengineering the Corporation: A Manifesto for Business Revolution*

Organisations can use the Internet to provide customers with up-to-date information and better customer service with greater flexibility, which certainly doesn't harm their image!

ANY ADVANTAGES TO CUSTOMERS?

Convenience is one of the important advantages that customers can gain by using electronic commerce. Shopping is not restricted by location, day, time or season. Electronic commerce gives customers a greater variety of products from which to choose and allows them to access product information in an efficient manner. This helps them comparison shop, which also facilitates competition, which results in substantial discounts.

Before online shopping, products were mass-produced and sold through retail outlets. Often, when you got the product home, you would find it didn't satisfy your requirements entirely. However, electronic shopping means you can specify your exact requirements. This concept of customisation means customers are more satisfied, and a happy customer is bound to come back and shop again. In electronic commerce, attracting customers and retaining them is very important, as there are thousands of Web sites offering just the same service.

Furthermore, since organisations that are engaged in electronic commerce can reduce inventories and lower their processing costs, they can deliver goods to the customers quickly. Some products, such as software, can be downloaded instantly. Another reason for a customer to be happy!

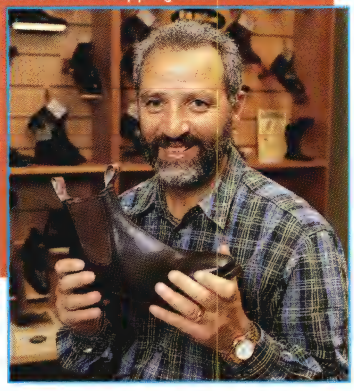
AUSTRALIAN BOOTS ONLINE

Boots Online is the online venture of Melbourne-based Stitching Horse Bootery, an RM Williams concept store. Since it established an Internet presence in 1995, the company's sales have increased dramatically. It has tapped into the vast export market, selling up to $1500 a week of RM Williams boots, moleskins, Akubra hats and high country coats. The proprietor of the Stitching Horse Bootery, Barry Michaels, realised that in order to be noticed among the millions of destinations on the Web, he had to offer something unique on the Internet. "When you're marketing via the Internet, you must have the best product available. Taking the best Australian boots to the world is our corporate goal," said Barry.

Boots Online is a well-structured site which provides product information, pictures and prices for 25 per cent of the store's 600 top-selling products. The site is based around the Cart32 shopping cart, which allows users on the Internet to add products to their shopping cart with ease.

The initial investment in the Web site of $3000 led to $75,000 in sales in the 1998-1999 financial year. As a result of the Web site, the store's total sales increased 15 per cent. Boots Online says 20 per cent of its online customers are repeat customers.

http://www.bootsonline.com.au



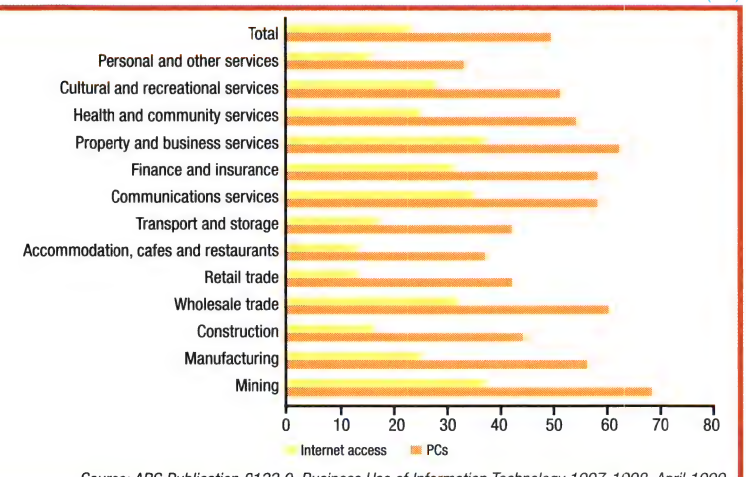
WHO IS ONLINE IN AUSTRALIA BY CATEGORY?

The intense interest e-commerce is generating has prompted research into usage patterns and participation rates by business sector. Although some of this data is kept confidential by the organisations conducting the surveys, there is enough evidence to show that there has been rapid growth in the use of electronic commerce in Australia.

This data indicates that on average 64 per cent of businesses use PCs, while 30 per cent of businesses have Internet access. The mining industry is the leader in PC use, and service-related industries are leading the way online. (Source: www.noie.gov.au.)

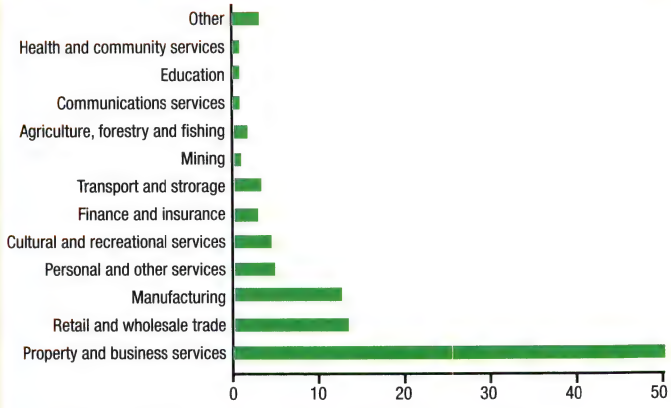
In 1999, the Department of Communications, Information Technology and the Arts conducted a survey into the distribution of Web sites by industry. This data shows that mining companies have relatively few Web sites compared to business-related organisations. (Source: www.noie.gov.au.)

EMPLOYING BUSINESS WITH PC AND INTERNET USAGE (%)



Source: ABS Publication 8133.0, Business Use of Information Technology 1997-1998, April 1999

DISTRIBUTION OF WEB SITES ACCORDING TO INDUSTRIAL CLASSIFICATION



Source: John Street and Danielle Aeukens, Results of a Survey: Electronic Commerce on the Internet, Department of Communications, Information Technology and the Arts, 1999

INTERNET AUDIENCE

Is the Australian public catching on to this new concept? The data that's available clearly indicates that there is a growing trend for Australian households to have Internet access and to adopt e-commerce.

- At the end of 1998, there were 1.7 million Australians accessing the Internet at least once a week (regular users). This is projected to grow to 5.7 million by 2003. Adding e-mail-only Internet users and casual users lifts the 2003 total to 10.9 million. (Source: Business Review Weekly , vol 21, no 29.)
- Internet-based commerce in Australia is predicted to grow from $61 million in 1997 to $1.3 billion in 2001. (Source: Department of Regional Development, NSW, Sydney, First for Information Technology and Telecommunications, 1999.)
- Over 12 months from August 1998 to August 1999, the proportion of households accessing the Internet rose by 27 per cent. This is 23 per cent of all Australian households. (Source: Australian Bureau of Statistics, Use of Internet by Households, August 1999.)

Electronic commerce opens an exciting new window of opportunity to businesses. It helps small businesses grow and large businesses save money – no wonder everyone's excited! ■

Business use of e-commerce

The number of Australian companies active in e-commerce is set to explode in the next 15 months. A fivefold increase in active Internet trading sites is expected to take the total to 40,000 by mid-2000.

That is the latest prediction from research group www.consult, which estimates that there are 8000 companies that now can boast a secure, Web-based ordering system that enables electronic commerce activity. Only 1000 companies had facilities like that a year ago. But 30,000 companies with access to Internet technology are still to make the leap into e-commerce. *Australian Financial Review, 1 April 1999*

Potential benefits to organisations

- Lower procurement processing costs
- Reduction in inventories
- Lower production cycle times
- Better customer service
- Lower sales and marketing costs
- Globalisation
- Better communication
- Improved information sharing
- Better delivery of goods

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on magazine cover disks. When you install the browser, it will ask for the details of your ISP. Once the software is set up, invoke the browser as you would any other application. It will dial your ISP and take you online!

However, this does not mean that your cyber-shop is online. First you need to design your cyber-shopfront. Then it must be hosted on a server. The server can be one of your own computers or it can be one of your ISP's. Most ISPs also offer Web site design as one of their services. Some businesses prefer to let their ISP handle all the technical issues.

TELECOMMUNICATIONS

To get online at a very basic level, organisations connect with a dial-up connection to a local ISP. However, when the business starts to grow, the next step is to lease a dedicated line from a local telephone company. This is a direct connection between the business and the ISP. There are various connection types and a choice of speeds. Fast connections have recently become more affordable so don't discount them out of hand.

WEB DEVELOPERS

There are lots of professional Web developers who can design slick-looking Web sites. It is worthwhile taking the time to shop around to find out Web development costs and the services on offer. Good Web developers design Web sites with future growth in mind so that, when the time comes, it is easy to add features like database connectivity and e-commerce capabilities, without starting all over again.

Many ISPs provide e-mail facilities, Web development, Web hosting and consultation. Another good place to find a Web developer is the Yellow Pages (http://www.yellowpages.com.au). Look under 'Web developers'.

APPLICATION SERVICE PROVIDERS

Traditionally, people have bought new software and installed it on their computers to use. Today there are application service providers, or ASPs, that work on a different model. Customers can pay per seat for applications distributed over the Internet. ASPs can install, maintain and upgrade software for a company on an ongoing basis. Businesses that don't have the time or inclination to follow new releases and upgrades can pay to have it taken out of their hands. This new software distribution model makes a lot of sense and is gaining popularity. Just be sure to investigate the integrity of an ASP you intend using, because they have the ability to view your data as they perform their allotted tasks.

TYPE OF CONNECTION	SPEED
Dial-up or dedicated analog modem connection	28.8K/33.6/56Kbps
ISDN connection	64Kbps – 256Kbps
T1 line	1.54Mbps
Satellite	64Kbps – 400Kbps
Cable modem	Up to 10Mbps

HOUSES ONLINE

Smith and Co. is an independent, family-owned and -operated real estate agent. Their physical presence was established in 1983 in North Rocks, NSW. They launched their Internet presence in December 1997, using One.Net as their ISP, and contracting Property.Com to do their Web design and development (http://www.smithandco.com.au). Currently, they are recording 25,000 hits to their site per month. Over time, their Web site has evolved to meet the demands of the market. Their launch of an Internet presence was in the realisation of the benefits of an online front, both for themselves and clients. They also recognised that it was easier for a potential client to search for property online, in the comfort of their own house or office. According to Nigel Smith, the General Manager for Smith and Co., "We felt that the Internet was here to stay, and that the real estate industry, as with any other industry, would need to embrace it with open arms. We saw it as a way that we could reach a much wider market than newspapers or magazines."

The services provided on the Web site are simple and uncomplicated. Visitors to the site can look at every single house that Smith and Co. has for sale. This allows homeowners to have access to a larger market, and makes house hunting a little easier, saving time and effort. Buyers can view pictures of the property to get a good indication of what the property is actually like. There is also the ability to join an electronic mailing list, which automatically e-mails the details of any new listings to its members. The service, powered by ListBot, allows users to keep up to date with the houses being listed, and turns searching for a home into an easy, pleasant, seemingly effortless experience. Further provision of information is planned, giving more specific location details such as a map, and details about the surrounding services. Smith and Co. also provides home loan services, with links to a preferred lender.

OUTSOURCING

Outsourcing is the contracting of another company to work for you. This means that special knowledge is hired from outside to do certain parts of a job. For example, a car dealership might outsource the implementation of its Web site to a Web design company so that it will have a professional look. Outsourcing becomes quite useful when you need professional expertise quickly but lack the time or staff to do it. Outsourcing is somewhat similar to subcontracting except that the outsourcing relationship lasts longer.

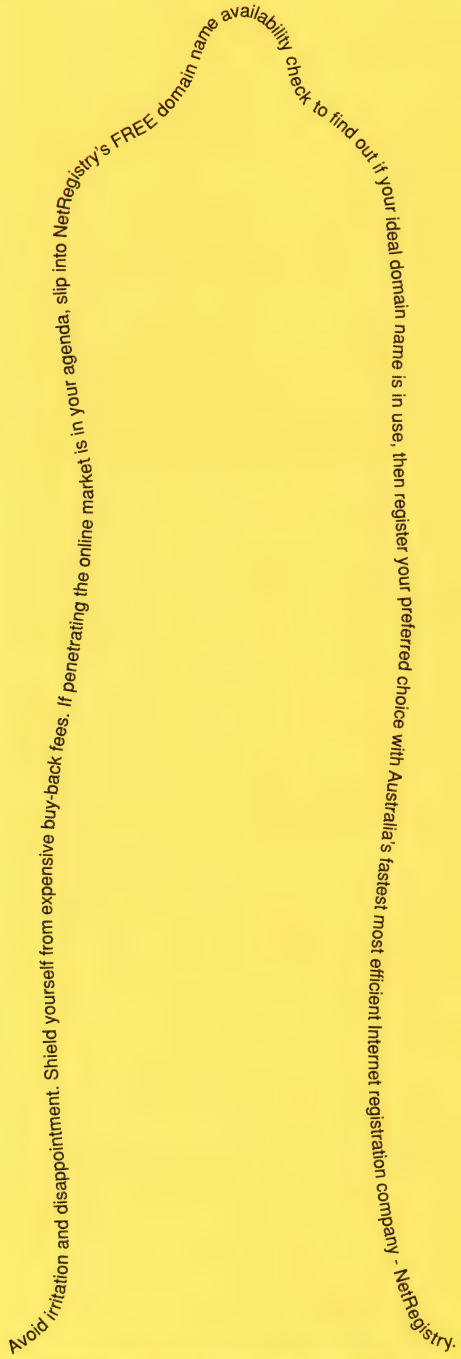
CONSULTANTS

Good consultants can advise you on market size, growth rate, future trends, current industry activities and the impact of new technologies on businesses. They usually have research groups that monitor market activities closely. For example, www.consult (http://www.consult.com.au) is an Australian consultancy that monitors market activities and performs related research so they can advise clients on new technologies and opportunities.

BANKS AND OTHER INSTITUTIONS

A secure online payment system is the essential component of an e-commerce site. This means a customer can purchase an item online and also pay for it online. For example, Camtech E-commerce (http://www.camtech.net.au) provides this service for both small and large businesses. NetCommerce (http://www.creative.com.au) is another company that provides e-commerce tools to businesses, ranging from online shopping and catalogue systems to shopping mall technology. A cheaper and secure alternative to traditional online payment is electronic-cash, or e-cash. St George Bank (http://www.stgeorge.com.au) is one of the financial institutions that provide e-cash to businesses and customers. ■

protection is easy



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Strategy, Strategy

You're a believer in online commerce and you know you need to rewire your business to stay competitive in the new economy – but you're not quite sure where to go next.

Related links

E-Commerce Times
http://www.ecommercetimes.com/

Link Exchange – low-cost e-commerce business tools
http://www.linkexchange.com.au

Peakhour – outsource your setup
http://www.peakhour.com.au

The Australian Industry Standard – Internet economy news
http://www.thestandard.com.au/

Business2.0 – coverage of the new economy
http://www.business2.com/

Harris Technology – built to make quids
http://www.ht.com.au

Webology – have your site hand-built to your specs
http://www.webology.com.au

Mbox – free voicemail, e-mail and fax
http://www.mbox.com.au

10 questions on e-commerce
http://builder.cnet.com/Business/Ecommerce20/

BY THOMAS LIDDLE

With software, form follows function, as a program manager friend of mine is fond of saying. He has a model of the space shuttle Discovery on his desk to illustrate the point.

"What's that thing on the tail for?" he asks potential new hires as he points to the Discovery's fin. If they answer, "To stabilise the craft", they get the point – and possibly the job as well.

EVALUATING YOUR TECHNOLOGY STATUS

The place to start for any business, whether you're a secretary or a bricks-and-mortar retailer going e-tailer, is to look at what technology you already use, and determine what you need to go online.

A secretarial services home business can eliminate a phone line and a fax machine by using free Web-based services which send and receive faxes directly to an e-mail inbox (see Related Links). Free e-mailed newsletter services such as ListBot will also bring in new business.

Small to medium enterprises may want to outsource the Web development, turning to an application service provider (ASP) or a consulting company.

And corporates with their own developers and legacy databases will find help in an increasingly large range of software tools such as Attachmate e-Vantage, designed to convert legacy data into HTML.

DETERMINE YOUR GOALS

The crucial step is determining goals. Remember, form follows function. What do you want to achieve?

Promotion is usually the first reason a company goes online. Sites can range from basic 'brochureware' to the elaborate interactivity of the award-winning Ford Australia site designed by Fluid (http://www.ford.com.au/).

But going beyond the brochure is the path to success. Get the functionality happening. Get your databases linked to the Web.

Before David Jones started its re-engineering process, the only way it knew how many umbrellas had been sold was to have a staff member go out onto the floor and count them. Wonder if they ever ran out of brollies on rainy days?

The inventory-supply chain advantage is summed up in recent

strategy!

Strategy, strategy, strategy! Strategy, strategy, strategy! Strategy, strategy, strategy

Gateway advertisements: "Would you rather buy a computer built three months ago, or one that hasn't been built yet?"

The classic example is the courier company UPS, which empowered its customers when it Web-enabled its internal, computerised parcel-tracking systems. Now in a few clicks customers can see exactly where in the world their parcels are at any given time.

Some physical retailers, such as the US software chain Egghead, went online and sold all their stores, making big savings in rental and warehousing.

Other businesses such as car dealerships need to keep their physical stores for marketing and to give customers the chance to touch and feel the goods.

Boxes of software (or hardware) don't need to be inspected. Cars do.

And if you're already a distributor, your bricks-and-mortar warehouse will be needed to back up your Web site anyway. The Telstra-AFR award-winning site, Wine Planet (http://www.wineplanet.com.au), started life as Camperdown Cellars in Sydney, and already well understood the distribution process.

MAKING THE MOVE ONLINE

It's time to make a checklist of the various Internet and digital technologies you need for your move online.

Databases need to be Web-enabled, customer services need to be considered, staff need to be Net-savvy and supply chains rewired.

The Web needs to be pervasive in your enterprise. E-mail, Web-surfing and an intranet should be basic.

Harris Technology, a Sydney-based company that sells computers, software and peripherals, uses Internet technologies to give customers, suppliers and staff Web access to its systems (see box, How Harris Did It). The company regards its Web site as integral to the business, not a competitor to the physical store.

> "BUSINESS GURU PETER DRUCKER, ASKED ABOUT THE FIRST DUTY OF A BUSINESS, REPLIED THAT IT IS NOT TO MAKE MONEY. THAT'S A GIVEN, HE SAYS. THE MAIN BUSINESS OF A BUSINESS IS TO CAPTURE AND KEEP A CUSTOMER."

EMPLOYEE MINDSHIFT

One of the quickest ways to get the staff up to Web speed is to give them Internet access. The other is to demonstrate the functionality available in a well-maintained internal network.

One Melbourne company uses the intranet for lunch orders. Staff enter their meal requirements from a menu input from nearby pizza, Asian and other takeaway eateries.

Unfortunately, the eateries haven't yet rewired their systems, so a staff member must phone through the orders, then pick them up. Perhaps one day soon the systems will interact and the food will be delivered!

DIFFERENT KINDS OF SITES

If you plan to build an information-only site, it should nevertheless contain basic functionality such as good product descriptors and comprehensive contact information.

It was a joke on the Web in the early days that there were only phone and fax numbers – no e-mail addresses. Today the reverse seems to be true. It can be hard to find a physical address or a phone number!

The rule here is: keep the information fresh. There's nothing worse than going to a corporate site to read the latest annual report to find that the 'latest' is '1997'.

STAGE 4

If you plan to run customer services through your site, keep in mind that there is little obvious return on investment and so you need to keep it cheap. Remember that software companies charge $35 an hour for helpdesk calls.

E-mail is a low-cost solution, but too slow to satisfy customers. Phone interaction is more human but is labour-intensive.

Some companies are using chat on their Web sites, with a customer service representative offering instant advice.

A big key to customer satisfaction: instant replies to e-mails work. Nothing beats being acknowledged.

CONSUMER E-COMMERCE

The customer is king. The Internet has exposed this truth like never before. A battle is now raging for the hearts and minds of people who have been put at the end of the chain for too long.

Why should I wait 20 minutes on a phone line because a bank has reduced staff and closed branches? Can't I just do my business via keyboard and Net connection?

Why does my wife love Greengrocer, the fruit and vegetables Web business run from a houseboat on Sydney Harbour? Because the company listens to her, that's why. It has added flowers at her suggestion, and dealt courteously with complaints. And just recently it added meat, fish, dairy produce and coffee.

Business guru Peter Drucker, asked about the first duty of a business, replied that it is not to make money. That's a given, he says. The main business of a business is to capture and keep a customer.

BUSINESS-TO-BUSINESS E-COMMERCE

One disadvantage of consumer e-commerce is that the consumer benefits are the same whether there are 100 customers or 1000. The main advantage is the time saved in travelling to a store, searching for the goods, buying them and bringing them home.

But greater gains are available in the booming business-to-business (B2B) market. Web sites cut search costs by scanning multiple Web sites and retrieving data entered by suppliers. Instead of painstaking phoning and physical-world contact-hunting, the automated HTML tools do it for you. 'Bots', or software robots, 'crawl' Web sites and return the information. Deals are then consummated by e-mail once sellers and buyers are informed.

Educational software company Dataflow recently started online B2B auctions in Australia to clear stock and deliver savings.

INTERNET SUPPLY CHAIN

Dell Computer was founded on the direct-sales model and an automated supply chain.

"The link between the day-to-day demand trend and the incoming material from your suppliers is crucial to your success – so the shorter you can make the link, the better off you are," says Michael Dell.

Speed to market creates competitive value that can be shared between buyer and supplier. Dell, which has no retail outlets, has fewer than eight days' inventory.

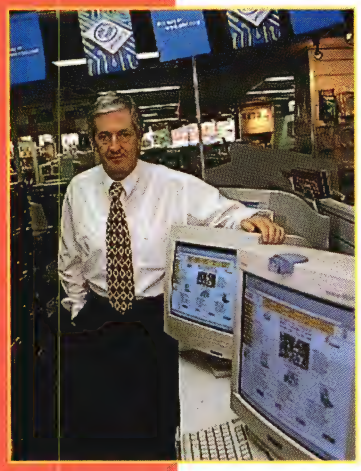
"The other reason we rewired our supply chain is that when it comes to delivering the latest product – no matter what it is – you're either quick or you're dead," said Dell.

Your online checklist

1. Current technology status: are your data systems ready for transfer to the Web, or do you need software to interpret legacy systems?
2. Internet technologies: Web-enabled databases, customer transaction functionality, feedback. See the box "How Harris Did It". Then decide if you want to 'buy, build or outsource'.
3. Employee mindshift: Web browsers on desktops, e-mail, intranet.
4. Information: company contact numbers, products, online ordering.
5. Customer service: e-mail addresses, feedback forms (monitored for fast response), call centre, live chat.
6. Consumer e-commerce: safe buying online, fax and phone options, discount for Web customers, tracking.
7. Are we B2B? Link extensively to your suppliers and automate the systems using open standards.
8. Application services: you may want to get someone to build, host and promote your site, with full e-commerce functionality.

HOW HARRIS DID IT

In 1994, Harris Technology was a single shop selling computers, software and peripherals in North Sydney. Three years later it was an online business as well, with a 50-person call centre in the basement.



While founder Ron Harris won't reveal sales details, he says the Web-based (www.harristechnology.com.au) business is growing exponentially.

Today the company is based at North Ryde and is part of the Coles Myer Group, which was so impressed with the technology developed by Harris that it bought the company in late 1998.

The company's challenge was the same as any business seeking to go online – it had a database (built in FoxPro) containing stock and links to suppliers' sites such as TechPacific, and now it needed to put it on the Web.

Advertising manager Ross de Lacey recalls, "We needed a mechanism to transport the live database to the Web so it would dynamically reflect stock availability at all times."

Harris decided to build rather than buy for two reasons:

- There were no software systems such as Cold Fusion available.
- Being a technology company, it was decided it should use the technology it was selling.

The connection to the Web was set up with Telstra using a Frame Relay connection which delivered a 512Kbps link. Today there are fibreoptic lines going into the North Ryde datacentre.

Microsoft's Winsock Proxy Server (then Catapult) was used for firewall protection. The Web site itself was a three-framed interface with as few graphics as possible to enable fast download.

Estimating the cost of the Harris setup was difficult because it was built incrementally over a period. But for a 'brochureware' site, de Lacey said a company would pay around $10,000. For more functionality, including Web-enabled database, the cost would be between $70,000 and $100,000, and for a full commercial site with transactional capability, up to $1 million.

– *Thomas Liddle*

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STAGE 4

APPLICATION SERVICES ACROSS THE NET

An application service provider, or ASP, is a company that makes Web applications and other software available by subscription.

The advantage to a business is that it doesn't need to spend potentially hundreds of thousands of dollars on Web-enabling technology. The ASP will offer the functionality – e-commerce, chat, share trading, banking – to your customers via its site or yours (possibly co-branded or hosted on your behalf) and collect a fee in return for its investment.

The ASP sales pitch is that it gives businesses the ability to quickly integrate interactive applications into any standard Web browser, combine personalised Web content with the managed applications, and manage the applications from a centralised point.

A yet-to-launch site called Surfboard Securities is a typical ASP in Australia's finance sector. It will offer advisers and their clients a platform through which they can interact, trade e-mail, manage their stock portfolios and trade directly in the sharemarket.

BOTTOM LINE

Whatever you decide to do in e-commerce, stick to a business plan with known revenue streams. Avoid the over-build and the desire to create content for content's sake. It's the services that you provide and the time you save your customer that will win out. ■

Keeping it legal

One element of your strategy will be to anticipate and manage the legal environment in which you do business. Prevention is better than cure, and far cheaper.

Why be proactive?

1. Flying blind is inconsistent with sound management. Strategic decision-making is a condition of fitness to survive.

2. Failing to be "law smart" is bad for your business. A dispute over copyright or trademarks will divert you from your business plan and could wipe you out financially. If your online contracts are unenforceable you may go broke. If you get caught up in misleading promotions, your brand image will take a battering and you and your company may be hit with fines.

3. Doing nothing may result in situations where you are taken by surprise. If you are taken by surprise you may be unable to avoid bad publicity. You will also be on the back foot in litigation or in dealings with enforcement agencies (e.g., the Australian Competition and Consumer Commission or Fair Trading Departments).

The first basic step is to work out the legal issues you need to address.

The second step is to work out how you are going to manage those risks. It is a good idea to map this out in a working "law smart" file and to update it regularly.

Take these steps and you will be well positioned to protect your interests and minimise your exposure to liability. You will also reduce the time and costs of a due diligence inquiry if you later seek funds for expanding your business by means of a public float.

Working out your legal issues is best done with a checklist approach. Any good e-commerce lawyer will have checklists for different kinds of e-business operations and will be able to quickly scope out what issues affect your business. A small expenditure now on at least a quick initial run-down is far more sensible than trusting to luck.

– Brent Fisse, Partner, Gilbert & Tobin

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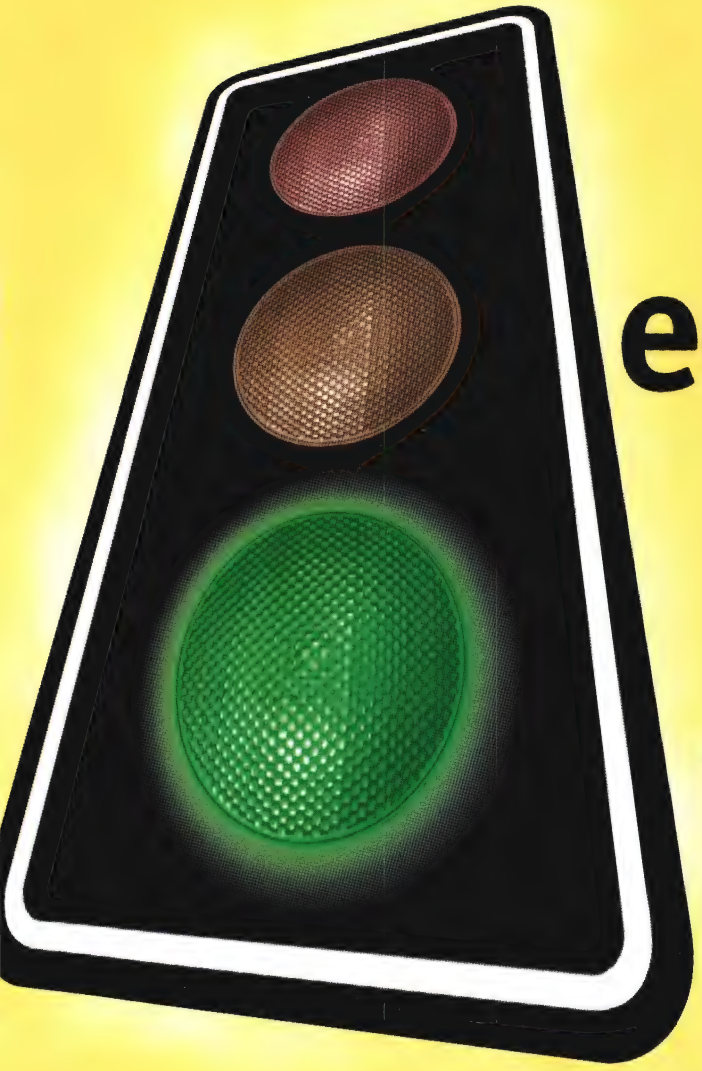

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*Includes 500 transactions per month. Additional transactions available if required. For security reasons, participating Web sites must be hosted using NetRegistry's secure servers. Full terms and conditions, including Commonwealth of Australia Government regulations, can be viewed at www.netregistry.au.com/terms/tandc.html

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Internet technology enabling your business

Smart companies are beginning to sport 'Internet Inside' tags like PCs wear 'Intel Inside'. The reason is that using the Internet and related technologies can save a company time and money as well as increase staff and business intelligence.

BY GRANT BUTLER

The basic building blocks are electronic mail (e-mail) and Web pages. Add readily available tools such as databases, encryption and online credit card payment capabilities and you have the basis for powerful internal networks.

The only warning is that while Internet technology is cheap and widely understood by users, it can be hazardous to install it inside your organisation. Not only will it change the way your staff interact with each other and the outside world, it also raises security and legal risks.

However, that hasn't stopped a lot of companies, including some of the world's largest. Perhaps frightened of the prospect of being left behind in the industrial age that made them, giants such as Ford Motor Company and BHP have commenced programs to connect their workers both at home and work.

Ford, for instance, is planning to provide its 350,000 staff worldwide with personal computers, printers and home Internet access for just $5 a month. The program is scheduled to reach Australia mid-year and will extend to the company's 5500 local staff, including factory workers.

Ford spokesperson, Louise Teasdale, says the scheme is aimed at educating staff about the new, wired world before it impacts the company's core production and other processes. It is also a form of company benefit to employees that will lessen the gap between information rich and poor within the company.

In March, BHP announced that it would be providing free Internet access for a year and subsidised computers to all its Australian employees.

"BHPvillage@bhp . . . encourages culture change towards an e-savvy workforce, empowered to learn and operate differently with new skills for the new economy," the company said in a statement.

Such a broad-based approach is unusual, however. According to research firm www.consult, only about one-third of the Internet-using companies it surveyed in August 1998 had provided 71-100 per cent of staff with Internet access.

E-MAIL

The most basic Internet application is also among the most useful: electronic mail. The great thing about e-mail is that it enables your staff to send and receive written messages internally and, if you allow them, to people outside your company.

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This can save them time and you money because e-mail can be used to replace phone and fax calls. This is particularly true if you do business interstate or internationally because it costs no more to send an e-mail to Wyoming than it does to Woolloomooloo.

The other great thing about e-mail is that you can attach Word, PowerPoint and other documents to messages. You can also send digital photos, either as attachments or within the body of a message.

With 1.7 million households connected to the Internet and, according to the Australian Bureau of Statistics, some 6 million adults having accessed the network in the year to November 1999, there is a good chance that your staff already know how to use e-mail.

However, this raises the first of the issues associated with it. E-mail can both boost and destroy productivity. Yes, it is fast and easy to use, but there is also the risk that staff will use it to chat electronically to friends instead of working.

News Ltd, for instance, took the view that e-mail was a productivity killer right up until the start of this year. Lachlan Murdoch wouldn't let staff at *The Australian* newspaper – computer writers included – have individual e-mail or Web access until it became obvious that it was impeding their ability to work competitively.

Another problem is that installing e-mail opens up your PCs or internal computer network to the threat of computer viruses, such as 'Melissa' that made headlines last year. Also, an e-mail system can represent an open door to hackers or even just a handy chute through which staff can release sensitive company information.

Finally, because e-mail will very quickly become the nervous system of your company, careful thought needs to be given to policies regarding reasonable staff use and privacy.

There is also the risk that an employee will download pornography, pirated software or illegal material and save it on the company's computer, making it potentially liable.

According to www.consult, security is the number one concern among companies that use the Internet. This is followed by factors including value for money, productivity loss, privacy and lack of technical support.

Yet, despite these issues, e-mail is a highly effective tool, leading many companies to sign on. So too are internal networks and networks linking companies and their immediate customers, suppliers and other partners.

INTRANETS

Intranets are internal company networks that look and feel like the World Wide Web but are only accessible to people within an organisation. Like the Web itself, they provide a powerful publishing platform that enables companies to cost-effectively distribute information to staff.

For instance, a company's list of staff phone numbers can be derived from an internal database and published as a page on an intranet instead of a piece of paper. This saves trees and ensures that the information is always kept up to date.

The idea can also be extended to other key company documents, such as training manuals and product price lists, enabling you to save a fortune in printing costs. You can also use intranets to distribute internal information such as memos, 'broadcast' video addresses from a chief executive, and maintain central company diary and scheduling systems.

A recent survey of chief information officers by Deloitte & Touche in the US found that 19 per cent of companies had an intranet installed, while another 52 per cent planned to create one within two years.

Notably, the line between the Internet and intranets is slightly blurred. Because they're based on common technology, private intranets can typically be accessed via the public Internet if a person has a password. This might seem confusing, but the beauty is that intranets therefore allow companies to spread themselves to anywhere on the Internet.

For instance, a legal firm might sign up a new

How to

GET E-MAIL

To use e-mail you can connect each member of your staff to the Internet then let them send messages over the public network. Here, you will need to obtain Internet access accounts from access providers such as OzEmail or Telstra.

Alternatively, you can create an internal computer network, or local area network (LAN). The advantage here is that your own LAN will not be dependent on the Internet at large and therefore will be faster and more secure and reliable.

However, you may need professional assistance to create such a network. You will also need to connect your entire LAN to the Internet if you want your staff to be able to send e-mail to people external to your organisation, which raises issues about security and viruses.

If you are concerned about viruses – and you should be – it is possible to install anti-virus software at the point where e-mails enter and leave your organisation. If your company is very small you may find it simpler to install virus-checking software on each of your PCs.

CREATE AN INTRANET

Intranets are created using the same tools as Web pages, such as Microsoft FrontPage. By the same logic, they are typically created by a company's Web design team which should also ensure that any new intranet is secure from the Internet.

BUILD AN EXTRANET

Extranets are sophisticated tools that are usually created by professionals who understand security and how to integrate databases and Web pages in real time. If you don't have this expertise within your company you should talk to larger Web design and IT systems integration companies.

Technical note standards

INTERNET PROTOCOL (IP)

The computer networking language that makes the Internet possible is known as Internet Protocol, or IP. The second key ingredient is the use of a common addressing system – the domain name system, or DNS – that makes the global computer network the Internet rather than just another internetwork.

IP was invented for the US military in the late 1960s by a team led by computer scientist Vinton Cerf. Its chief characteristic is that it was developed to withstand nuclear attacks. This was achieved by breaking data up into small 'packets' that could follow changeable routes then be reunited to form sensible messages upon reception at another computer.

This flexibility has made IP robust enough to cope with the variable quality of the world's phone network but less than ideal for handling time-dependent data streams such as phone calls or audio and video transmissions. However, every year better technology appears that compensates for IP's weaknesses. It should not be long before IP becomes the dominant platform for internal company and global digital communication.

agent interstate. Instead of posting piles of literature to them about the company's structure, policies and procedures, they can simply invite the new recruit to log onto their intranet.

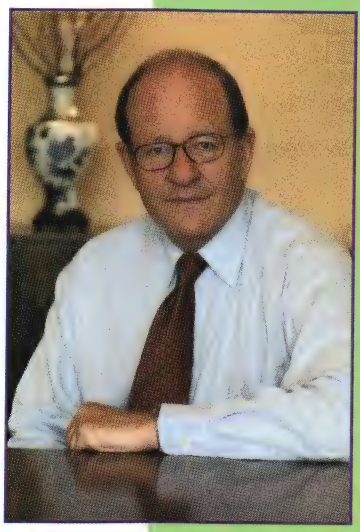
EXTRANETS

Given that intranets are useful inside companies, it makes sense to extend them to regular customers and suppliers. Such extended intranets, or 'extranets', combine intranet and Internet technology to join parties in semi-private networks that can be used to facilitate information exchange and trade.

Mid-sized Australian computer goods distributor Data#3, for instance, has developed an extranet that now extends to 450 of its customers. They log into the network using a normal browser and, upon entering the secure extranet environment, are presented with customised Web pages listing products and the particular prices that they would pay.

This information, plus any additional terms and conditions and e-mail links to appropriate Data#3 account management staff, is generated dynamically and in real time by blending the company's normal public Internet pages with specific information relating to each customer. ■

IT EXPERIENCE



Osborne and Associates Lawyers was established in 1992. Based in Macquarie Street, Sydney, it is now a firm of three solicitors and support staff. In mid-1999, the firm's principal, Ron Osborne, a commercial lawyer with over 30 years' experience, had the firm's system connected to the Internet.

"The magic of e-mail and the Internet is the cost saving and convenience on exchange of lengthy documents between ourselves, clients and other solicitors," he said.

"This will become more prevalent once e-security technology instills further confidence in the business community. But most of all, clients have come to expect it!"

Osborne and Associates has given e-mail access to each of its employees but it is the e-mail address of the responsible solicitor that appears on all outgoing correspondence. The firm also uses an intranet to make specific legal resources available to all staff. According to Osborne, this means the firm no longer has to rely on a massive paper library and has also created a better working environment.

The firm is now building a Web site which it plans to use to distribute information to clients about changes in the law that could concern their business. It also plans to use the new medium to publish 'e-business' specific material such as e-mail and privacy policies, basic online terms of trade and disclaimers.

"Law firms like ours can now supply these documents electronically, and clients can then upload straight onto their e-business sites," said lawyer Nick Hogan.

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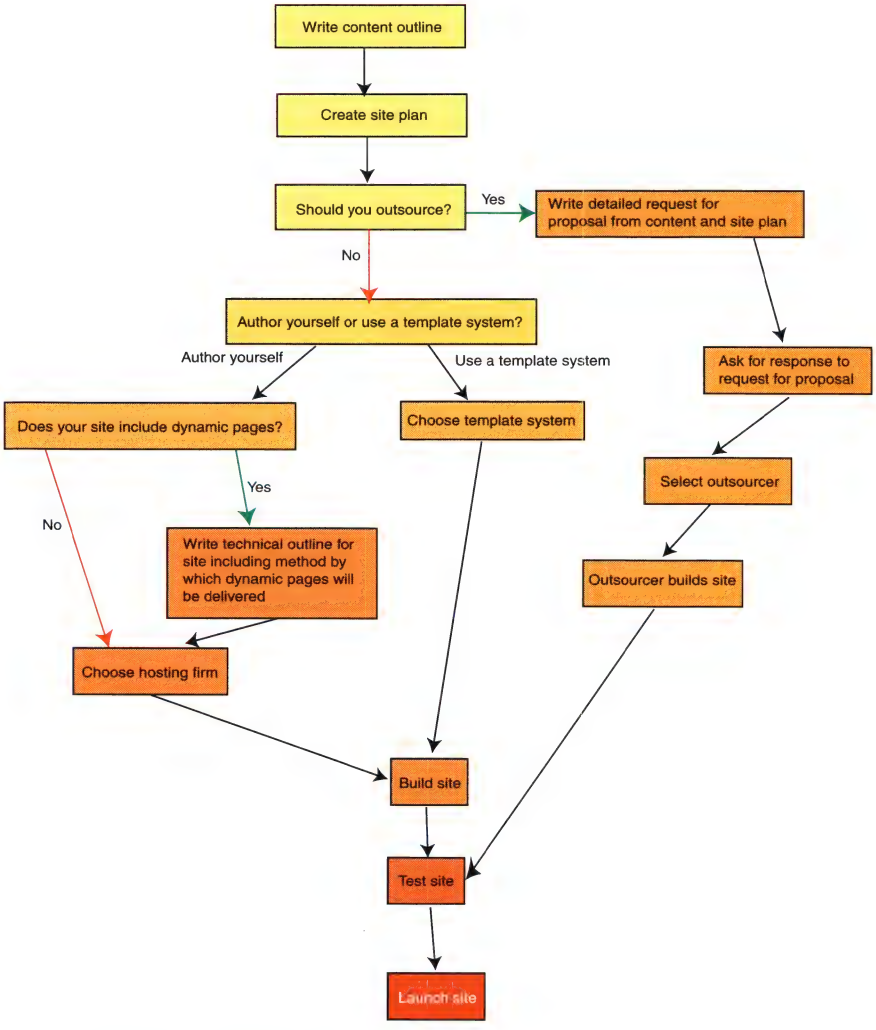
WHERE DO I START?

The following flow diagram explains how to get your information site online. This stage of eComWorld will go over some of the important steps in this process.

The steps to an information site



WRITING A CONTENT OUTLINE

Your content outline will determine the information you provide your customers, the structure of your site, and ultimately the technology that is used to run your site.

Your site may be as simple as contact details and information about what a company does. Or it may be complex and provide searchable documentation, product specifications, news and announcements, and even product specials.

The amount and type of content you provide online will be a balance of your audiences needs, the percentage of your audience online (now and in the future) and the cost you wish to incur reaching that audience through Internet technology.

For example, the developer of a computer application for use when connected the Internet would most likely want an extensive site and have little or no expenditure on other ways of providing information (excluding marketing). This is because 100 per cent of the company's customers will be connected to the Internet and they will most likely refer to the company Web site first.

However, if you are a manufacturer of building materials and only a percentage of your customers have Internet access while at work, you will still need to produce printed specification sheets. You may wish to build a site that includes some of those specifications or at least tells how to get hold of the printed sheets. Of course, you may decide that it is worth putting all this data online if you feel that it will polarise your customers who are already online into using your products over your competitors.

In creating your content plan, you should complete a table such as the example on page 29 for Watkin Street Furniture, a hypothetical furniture manufacturer. Replace the other fields with categories specific to your company.

CREATE SITE PLAN

The site plan (see page 30) determines how visitors to the site will work their way around your site. Based on your content plan it outlines how the pages link together and what they contain, and will help determine the technology that delivers them.

The type and volume of information you decide to put on your site will determine the type of information site you need and, naturally, how much it will cost.

The above content plan for the hypothetical Watkin Street Furniture includes 23 pages that change monthly, on average. This is a very basic site which, once built, will require little ongoing maintenance.

However, your site may be far more complex. The number of pages and the frequency with which they change will determine the technology your site will require.

There are two key types of pages on a Web page: static and dynamic.

Static pages: static pages are made up of text files that include html (hypertext markup language pages) tags. These files exist on a Web server in a similar way to the Microsoft Word documents that exist on your hard disk. They can be edited and changed using html editors (or a text editor such as notepad, or even using Microsoft Word). They are easy to create using a wide range of tools and require very little experience (although making them look good is harder). Static pages are ideal if the pages change infrequently, if you have few pages or if you do not intend to integrate the pages into an electronic commerce system.

Dynamic pages: Dynamic pages are created when a user accesses a Web server. They are a combination of data from a database and html. The idea is that only one html page (often referred to as a template) is required, into which the data from the database is placed depending on context. PC World's Web site (pcworld.idg.com.au) offers a good example of dynamic pages. The "Home" page includes html into which the latest headlines are placed. In fact, the "Home" page uses the same template as the "News" page, "Web & You" page and so on. The stories on the page and the name of the page dynamically change to match the section you are in. When you click on a story, the article template opens. The page is filled with the content of the story you selected from the previous page. Dynamic pages are well suited to the delivery of large amounts of information in a standard format, particularly where that information is already in database format. Dynamic pages reduce the amount of html work to be done and can make it easier for non-html proficient staff to include new content. In addition, they allow information to be displayed in a myriad of ways by using databases queries. The downside of dynamic pages are that they are more difficult to set up.

There is a mid-point between static and dynamic that provides the advantages of minimal amounts of html coding without the need for a database. These take a number of forms: cascading style sheets, dynamic html, and the forthcoming XML (extended markup language) and XSL (extended stylesheet language) technologies. These systems can also be used with database-driven content to great effect.

It's likely that if you intend to go beyond just a basic site you will end up using a combination of static and dynamic pages and perhaps stylesheets and XML. The static pages will contain information that changes infrequently, while the dynamic pages will probably be products from catalogues or information suited to database storage.

However, that doesn't mean that you need to go out and buy the Oracle developers handbook, now or ever. (Unless you've already had experience building databases, you'll probably want to leave them to others.)

There are alternatives to building your own dynamic pages: consultants; Web-based systems that have already been built that just require you to add your data; and software applications that you can run on your system that keep your content in a database but which update your site with static pages.

It is even possible to build a basic static site with the intention of adding dynamic content at a later date. For example, our hypothetical Watkin Street Furniture company may build its site based on the content plan, with the intention of later adding database-driven dynamic content for its extensive kitchen range.

For simplicity, the dynamically generated kitchen specifications are displayed on the site plan on page 30 as a cylinder to indicate that they are database content. A database is made up of tables, which in turn are made of rows and columns. You could think of a database table as much the same as a spreadsheet page, with the column headings across the top and the data in the rows below.

Information is extracted from the database using queries.

Content plan example

Content plan for Watkin Street Furniture, a fictional manufacturer of furniture

INFORMATION TYPE	DETAILS	NO. OF PAGES	FREQUENCY OF UPDATES
Company information	Owners, industry bodies, about the company, all plantation timber policy, about our craftspeople	6 pages	Monthly
Contact information	Company address, phone, e-mail, fax, etc.	1 page	Rarely
Order information	Phone number and delivery costs	1 page	Rarely
Product/ service ranges	Dining, lounge, bedroom, kitchen	5 pages	Monthly
Product/ service details	4 pieces in dining, lounge, bedroom. Kitchen is modular with 50 options. List options here	13 pages	Monthly
Product/service technical specs	Not applicable		
Pricing	Not applicable		
Other	Not applicable		
Other	Not applicable		
Other	Not applicable		
		Total pages: 26	Average frq: Monthly

While you don't need to create the database or code the queries yourself, understanding the concept of queries will help you convey your requirements to the Web development company. This understanding will also help you create dynamic parts of your site that are modular; in other words, dynamic features that you will be able to use somewhere else in your site.

Your site plan should also include some basic navigation that should be on all pages of the site. Links to the home page, other key top-level pages and to the contact and order pages are usually all that is required. In our example site plan on page 30, the pages which would be linked to from the navigation panel on all Web pages are in green.

SHOULD YOU OUTSOURCE?

Having a content plan and site outline means that you are now ready to build your site. Importantly, these plans contain the information that will enable you to determine if you can build the site yourself or if you should outsource. The decision to outsource may come down to a number of factors:

- Budget for your project
- Time
- Skills and/or confidence
- Complexity of site plan

If your plan calls for a basic site made of static pages, and you have a day to spare, it is well worth attempting to build the site yourself. If it works out, some of the site will be built that day, you will be able to determine how long it will take you to complete the job, and you've saved yourself some money! If

you're unhappy with your progress, you will have lost only a day but learned a valuable lesson about the intricacies of Web design that will help you in your dealings with outsource companies and consultants. (If you've never built a Web page, try our mini-tutorial "Can you do it yourself? Build a page self-test" on the eComWorld Web site. It takes you through the basics of creating a Web page. You may be surprised how easy it is!)

If you do decide to create your own site, look to WYSIWYG (what you see is what you get) editors such as Adobe GoLive, Adobe PageMill, HoTMetaL Pro, Macromedia DreamWeaver, Macromedia Drumbeat, Microsoft FrontPage and NetObjects Fusion (for full reviews of WYSIWYG and text html editors, see the eComWorld Web site). You may also need a graphic application that can create Web graphics — most do nowadays, to varying ability. Once you've chosen your applications, a good book that explains how to use each application will help immensely.

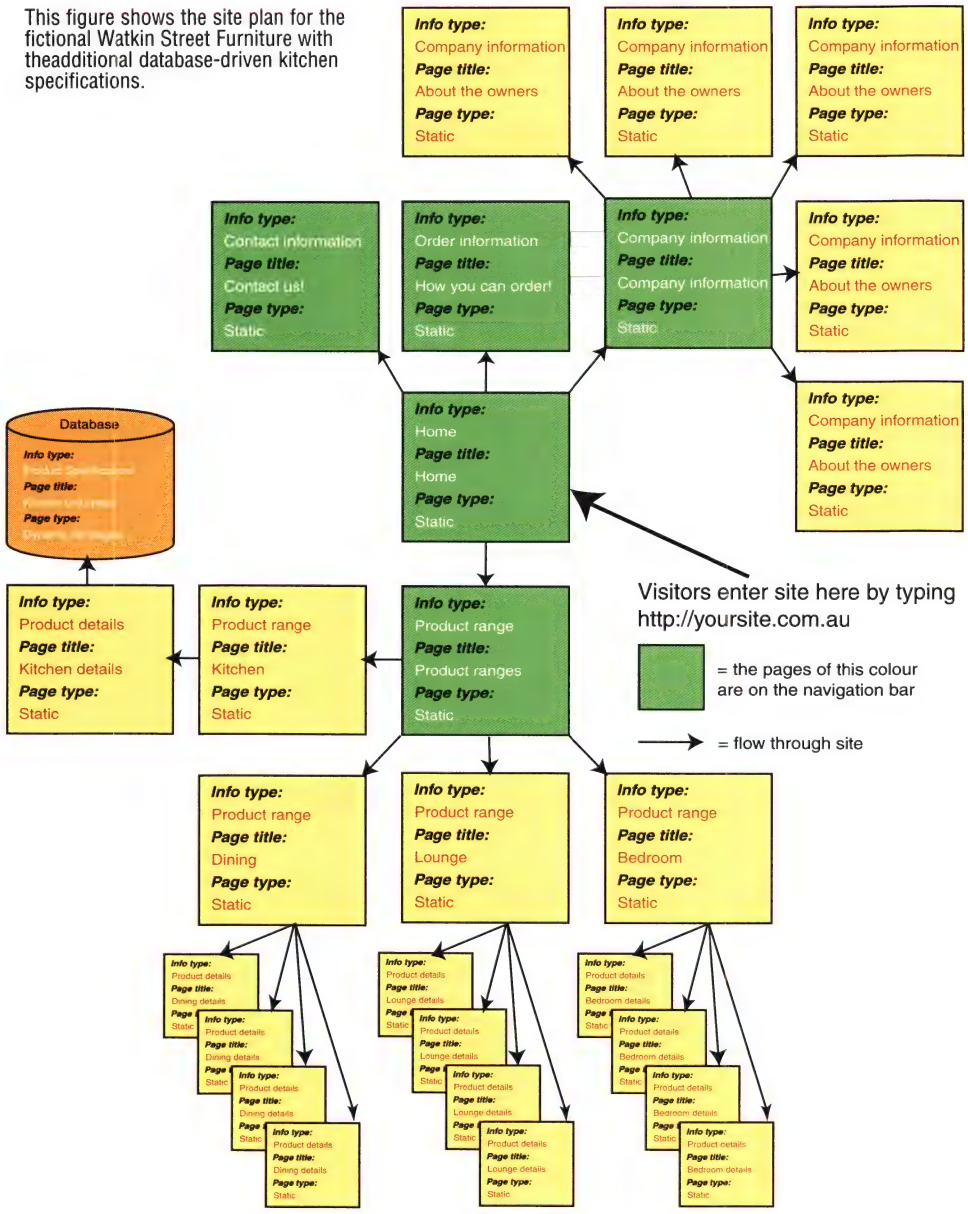
If you don't want to spend the money on an Internet development company — yet do not feel confident enough to build your own site — you can turn to a template-driven system. Template systems either run as a service from an Internet hosting firm or are an application that you run on your own machine that updates to the Web host of your choice.

Products that run on your own machine and upload data to your hosting company — such as iNetStore and esiwebsite — step you through the process of creating a basic site. Generally, the systems offer a number of alternative designs and usually allow you to insert your own graphics such as company logos.

If your site includes large numbers of pages or dynamic pages, it is likely you will wish to outsource. To do so, you should take your content and site plan as a base, convert them into a request for proposal and contact a number of Web development companies. For more complex projects, ask for the proposal to be broken down into stages, with a cost and deadline for each stage and signoff on those stages. The initial stage should be a complete project plan agreed to by both parties and based on your content and site plan. Also ask for the outsourcer to provide hosting options if it is part of their service.

Figure: Site plan for Watkin Street Furniture

This figure shows the site plan for the fictional Watkin Street Furniture with theadditional database-driven kitchen specifications.



If the site will include dynamic pages, be sure the outsourcer provides technical details including dynamic page generation engine (ASP pages, PHP, etc.) as well as the underlying database.

In this case you should be sure that the developer outlines the hosting requirements, as moving your site from one Web host to another is far more difficult with database-driven dynamic sites. This will also make it simpler to shop around for quotes on hosting.

Determine to your satisfaction who owns images, database code and any other relevant intellectual property before you proceed with the outsource agreement.

Finally, make sure that adequate attention has been given to maintaining and updating the site. A simple update process will reduce the ongoing costs of keeping your site up to date. (For more information on outsourcing Web design, refer to the eComWorld section of PC World's Web site, http://pcworld.idg.com.au). ■

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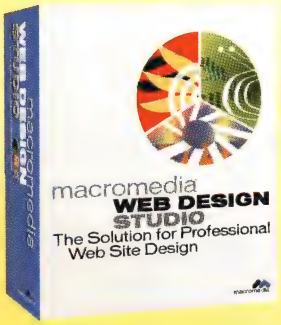

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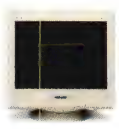

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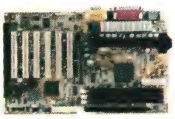
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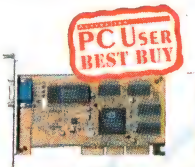

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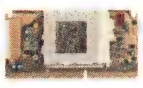
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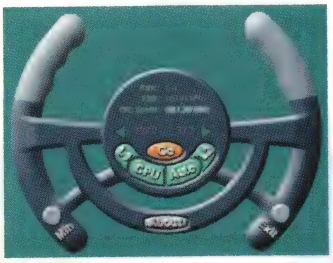

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Multi-boot:

Adding Linux and BeOS to your Windows machine

BY RODNEY GEDDA

The trial of more than one operating system on a single PC is far more difficult than that of different application software. Yet, in order to ensure you are using the most suitable operating system, installing and using alternative operating systems is a must.

This month in Upgrader, we have prepared a special report to show you how to install more than one operating system on your PC. And, to help you even further, we've included the latest version of RedHat Linux (6.2) and BeOS 5 Personal Edition on the PC World cover CD-ROM.

In this step-by-step article, we show you how to install Linux on your existing Windows 95 or 98 machine in a separate partition so that when you boot your machine you will be able to launch either operating system. The addition of RedHat will require 1.7GB of spare disk space for a complete install or 700MB for a minimum install. We also show you how to install BeOS 5 Personal Edition. This is the most recent release of the Be operating system, is free for personal use, and is designed to be installed and launched from within Windows.

Before you begin

Before you begin to install a new operating system you should make sure you back up your system and make additional copies of any important files that you may be using. Also, be sure to pay careful attention to all the steps involved with reference to your computer's hardware specifications.

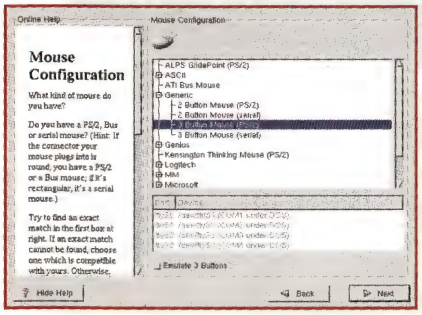
STEP 1 **Windows and Linux** operate on different file systems, therefore Linux needs its own special space on the hard drive. This is accomplished by "partitioning", or dividing the drive into logical sections which belong to the different operating systems. Some partitioning utilities like fdisk can destroy data if used incorrectly, so these aren't recommended for beginners. Fortunately, RedHat Linux includes more advanced partitioning tools such as DiskDruid which can accomplish this task without destroying your existing data, and there are also commercial packages like PartitionMagic for the same task. Whichever tool you use, you'll need to make sure there is enough free space on your hard drive to hold all the operating systems. For a complete package installation of RedHat Linux, you will need to set aside a minimum 1.7GB of disk space.

STEP 2 **Beginning the Linux installation.** The RedHat 6.2 distribution is provided on a bootable CD. If your CD-ROM drive is bootable, beginning the installation is as easy as restarting the computer with the RedHat CD in the drive. If your CD-ROM drive is a boot device but not enabled, configure your computer's BIOS setting to boot directly from the CD-ROM. This is done by changing the boot sequence to CD-ROM before the hard disk. If your CD-ROM does not boot directly, then a Linux boot disk must be made before you can begin installing.

To make a boot floppy disk under MS-DOS, use the rawrite utility included on the RedHat Linux CD in the dosutils directory. Insert a blank 1.44MB floppy disk into the drive, open a DOS session and with RedHat Linux CD in your CD-ROM drive issue the following commands:

```
C:\> d: (or whichever label is for your CD-ROM)
D:\> cd \dosutils
D:\dosutils> rawrite
Enter disk image source file name: \images\boot.img
Enter target diskette drive: a:
Please insert a formatted diskette into drive A: and press –ENTER– : Enter
D:\dosutils>
```

Once rawrite has copied the boot image onto the disk you can begin the RedHat Linux installation by rebooting your computer with the boot floppy disk in the drive.



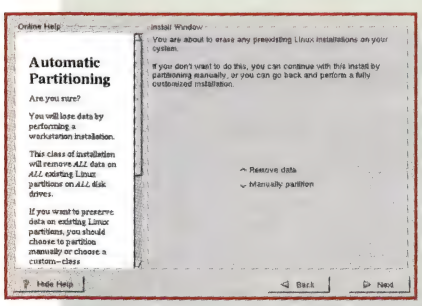
STEP 3 **The Linux installation.** After restarting the computer with the Linux boot disk or CD-ROM, the installation begins. You will encounter a number of options relating to your computer's hardware, so make sure your PC's specifications aren't too far away.

For most new users, choosing the workstation install option is most suitable. (If you already have an earlier version of RedHat Linux (version 2.0 or later), then you may consider the upgrade option. This will avoid overwriting any existing data.) **Do not select the server installation unless you are setting up your PC to be a server.** If you do, all files on all your partitions (including Windows) will be overwritten.

STEP 4 **Partitioning your hard drive.** You will reach a point in the installation where room on a hard drive for Linux must be made available by partitioning. RedHat Linux includes an automatic partitioning tool that can be selected if you are unsure about how to go about it. Alternatively, the partitioning tool Disk Druid can be used, which will appear if you choose to manually partition.

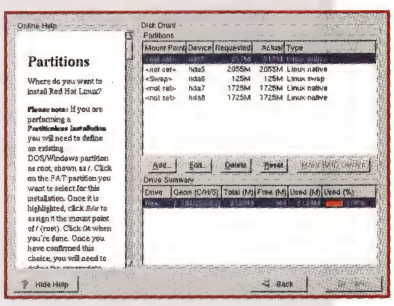
STEP 4.1 **RedHat automatic partitioning.** If you have not previously partitioned your hard drive then this method is recommended. You will presented with an option to use automatic partitioning or to do it manually.

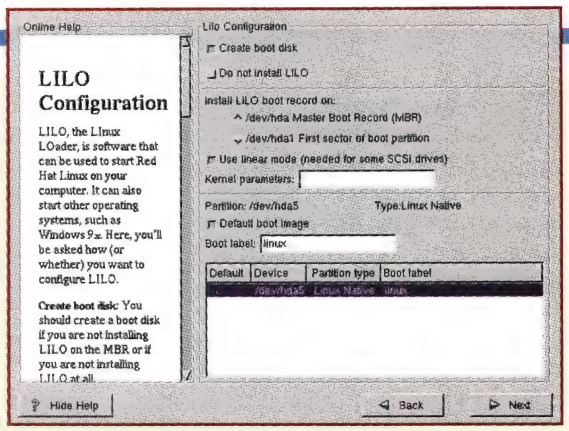
However, choosing to partition automatically will result in all data on all pre-existing Linux partitions being erased. If you wish you can select the partition manually option. This will lead you to RedHat's manual partitioning tool, Disk Druid.



STEP 4.2 **Partitioning with Disk Druid.** Disk Druid will allow you to manually partition your hard drive, and is more user friendly than fdisk.

It is recommended that you create three partitions that will be used by Linux: a root partition (at least 1.7GB is recommended) where all the Linux files are stored, a boot partition of no more than 16MB for files used in the boot process, and a swap partition of at least 16MB to support virtual memory. Selecting ADD and labelling the type of partition in the mount point box creates these partitions. For the root partition type "/", for the boot partition type "/boot", and type "/swap" for the swap space. Enter the size of the partition in megabytes, select "grow to fill disk" and the partition type (e.g., Linux Native). This is done with the allowable drive (the hard drive you can partition) box selected. This process will result in a smaller Windows partition and the above-mentioned Linux partitions. The newly created partitions can then be formatted and you are ready to complete the installation.





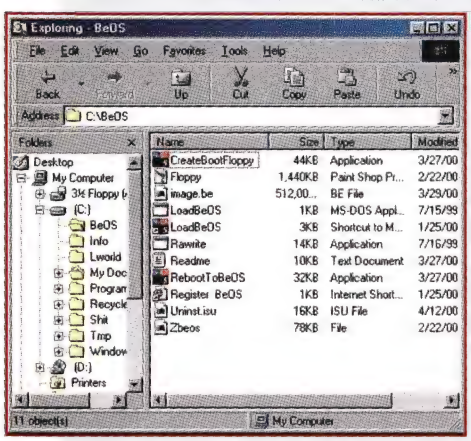
STEP 5 **Completing the Linux installation.** In order to start Linux once it is installed you will need a boot manager. The one that comes with RedHat Linux is LILO (LInux LOader). Choosing to install LILO on the Master Boot Record (MBR) will give you the option of booting to Windows or Linux when you start your computer. Default options to the LILO boot command are entered into the kernel parameters field. Every bootable partition is listed, including partitions used by other operating systems. The bootable partitions are given a label, which is typed at the LILO boot prompt to start that operating system. It is common to label the Linux partition "linux" and the Windows partition "dos".

All that now remains are a few elementary tasks such as adding a user account and package selection. The packages are then installed and the boot disk option is carried out. After this you can reboot the computer and begin using Linux. This will occur in the form of a prompt "lilo boot:" where you can type linux or dos. There is also a timeout of five seconds before the default label is loaded. Pressing enter will also start the default label.

Having more than one operating system on your PC will allow even the most inexperienced computer user to gain a broader understanding of the advantages and capabilities of each OS.

Installing BeOS 5 Personal Edition

As an alternative to Windows and Linux for the Intel platform, the Be Operating System (BeOS) can be set up with relative simplicity. The entire operation can be done within Windows by double clicking the BeOS package file which is located on the PC World CD 1 — see the HTML content on the CD-ROM for more information.



This will begin installing the entire operating system to the newly created BeOS directory in a Windows drive of your choice. However, before you jump to trying this Mac-like OS, be sure you're prepared to spare a hefty 512MB of disk space.

Once BeOS has been installed it can be easily started from within Windows by clicking the startup icon created on the start menu. The process of starting BeOS will close Windows and begin the separate operating system. To return to Windows or Linux you will need to restart the computer. The BeOS Personal Edition will give you a taste of how this operating system works. BeOS 5 Pro edition is available at a cost and includes more applications such as Internet and multimedia software. The Pro Edition is installed on its own partition, and technical support is provided. ■

For more information on installing RedHat Linux 6.2, open the /doc/install-guide/index.html page on the PC World RedHat Linux 6.2 CD-ROM in your Web browser.

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Give us this day our daily tip

BY SCOTT DUNN

Remember when you first installed Windows 95 and that annoying "Welcome to Windows 95" message appeared in the middle of the screen every time you rebooted? Remember how quickly you unchecked 'Show this Welcome Screen next time you start Windows'? (Windows 95 users can relive the moment: choose *Start-Run*, type **welcome**, and press **<Enter>**.) Fortunately, Microsoft has found a less obtrusive way to give you an occasional message. All you need is Windows 98 SE, Windows 2000, or Internet Explorer 5. (If you're a Windows 95 user who installed IE 5 without first installing IE 4's Desktop Update, the following will work only when browsing Web pages.) In any folder, browser, or Explorer window, choose *View-Explorer Bar-Tip of the Day*. A small pane opens at the bottom of the window containing a tip. Click the *Next Tip* link if you want to see more. Or drag the bar separating the tip from the rest of the window to adjust its size. The tip will stay visible until you close the window. If you display the tip pane in a browser window, it should reappear the next time you launch Internet Explorer (with Windows Explorer or folder windows, you have to manually display the tip pane each time).

Unfortunately, many of the tips apply only to IE 5, but the possibilities for that space are endless. If you'd like to see a tip about some other aspect of Windows, or view a periodic reminder to back up your files, or even use the tip pane to send messages to other people who use the computer, you can replace or add to the list of tips that cycle through. The trick lies in editing the HTML file.

FIGURE 1: Add Custom Tips to Windows Explorer or Internet Explorer by editing the Tip.html file in the Windows/Web folder.

Custom tip lists

Here's what to do. First, use Explorer to locate the Tip.htm file in the Web folder in your Windows folder (FIGURE 1). If extensions are hidden, the name appears simply as "Tip". Copy this file to another folder as a backup, so you can restore it to the original folder if anything goes wrong. Next, choose *Start-Run*, type **notepad c:\windows\web\tip.htm** (your path may differ), and press **<Enter>**. To add a tip or message, scroll almost to the bottom of the file until you see lines that begin 'div ID="Tip73", div ID="Tip74"', and so forth. Click at the end of the last of these paragraphs (following the text "/div") and press **<Enter>** a couple of times to separate your addition from the existing text.

To introduce your tip, type **div ID="Tip75" Style="display:none;"** (or simply copy this header line from any of the tips in the file and paste it where you added the carriage returns). Just remember to adjust the tip number so that it sequentially follows the last tip's ("Tip75" if your last tip was "Tip74" and so on). Type your message, or copy and paste a short tip from another source. It's best to limit text to one paragraph so it fits in the tip pane. Complete the tip by typing **/div** at the end of the last paragraph. Add as many tips as you like; just remember to number them sequentially, following the example of the original tips in the file.

Finally, look for the line that begins 'var nTips=' near the bottom of the file (about 20 lines from the end). Edit the number to the right of the equal sign so that it represents the total number of tips, including Tip0. So, if you have tips numbered from 0 to 75, this line should read 'var nTips=76;'. When you're done, save the file.

Now click in the tips pane at the bottom of your browser or folder window and press **<F5>** to refresh the content. You should see your additions, or at least be able to get to them by clicking *Next tip*.

Not satisfied? You can also change the "Did you know..." text at the top of each tip — just reopen Tips.htm in Notepad and search for that phrase. Edit as you please, but be sure you don't change any of the surrounding code. To apply bold type, add b at the beginning and end of the phrase you want to emphasise. To customise the graphic that appears next to the tips, replace the Tips.gif in the Windows\Web folder with any (preferably small) GIF image; rename the original (to something like Tips.bak.gif), then name the new file Tips.gif (or just plain Tips if extensions are hidden). Windows will resize your picture to fit the allotted space.

To change the display size of the picture, look for the phrases width="27" and height="36" in the Tip.htm file, and replace the values of the width and height in pixels. ■

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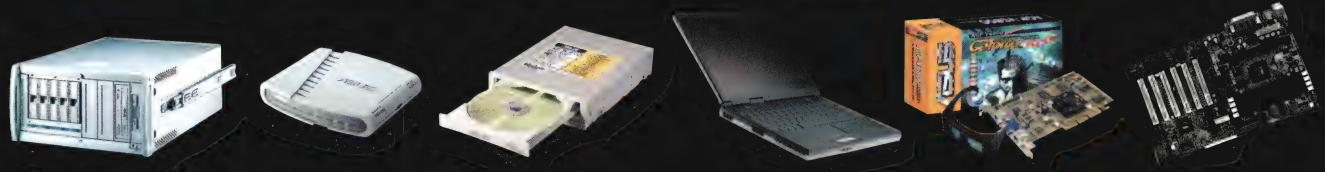

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Open one file type in different applications

BY SCOTT DUNN

Windows recognises a file's type by its three-digit file extension (which Windows 2000 hides by default) and will associate each type with one application. What if you open a file in multiple applications? You could do this in Windows 9x, but not easily. (See this month's "Windows Toolbox" page 125, for a software solution.) Fortunately, in Windows 2000, the capability has improved.

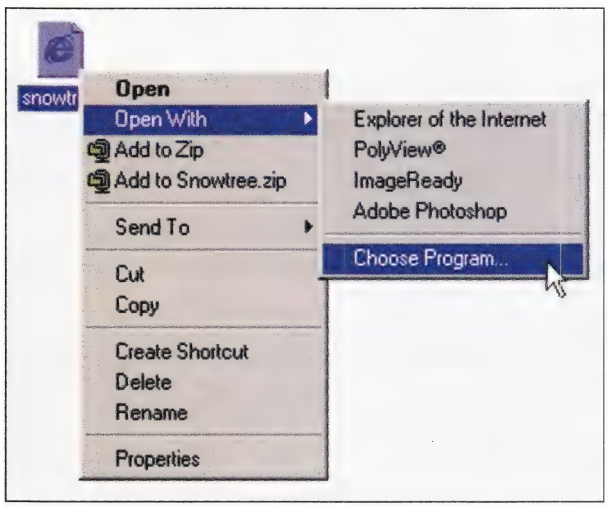

FIGURE 1: Windows 2000 makes it easy to assign multiple apps to open a single file type.

MAKE YOUR MENU: right-click any file icon and choose *Open With*. The first time you do this for an unassociated file type, you'll be presented with an *Open With* dialogue box listing several installed applications. Select one, or click *Other*. Select the application file from your hard disk, and click *Open*. Then click *OK*. Next time, you may still have to display the Open With dialogue box and select another application. Once you've opened a file type in two or more applications, you'll get an Open With submenu that lists all the applications you've used to open this particular type of file. If the application you want is not on the Open With submenu, click *Choose Program* and repeat the steps to add it (see FIGURE 1). The Open With submenu always shows the default program at the top; items are then sorted by date of use, with the most recent application first.

CHANGE DEFAULT ASSOCIATIONS: to change the default application for a file type, right-click a file and choose *Open With-Choose Program*. Select an application from the list, and check the box labelled "Always use this program to open these files". Then click *OK*.

Now, the hard part: if you want to rename or remove an item from the Open With menu or Open With dialogue box, you'll have to edit the Windows Registry.

Since this is risky, you should backup the Registry first: choose *Start-Programs-Accessories-System Tools-Backup*. In the Backup window, choose *Tools-Create an Emergency Repair Disk*. When prompted, insert a floppy disk and check *Also backup the registry to the repair directory*. Click *OK*. If you run into trouble, these tools might help; if not, you might have to reinstall Windows — so proceed at your own risk.

REMOVE A MENU ITEM: if you add an item to your Open With menu and later decide to remove it, run regedit and navigate down the tree on the left until you come to the branch HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\FileExts. If necessary, double-click the *FileExts* folder to expand the branches beneath. Find the file extension for the menu you want to edit, and double-click it. Then select the *OpenWithList* key under the extension key. In the pane on the right, select the icon corresponding to the menu item you want to remove. (You won't see the menu item by name, rather the name of the file that the menu item launches.) Press **<Delete>** and click *Yes* to confirm.

RENAME MENU AND DIALOGUE BOX ITEMS: if you navigate through the menu using keyboard shortcuts, renaming the items in your Open With menu and Open With dialogue box can ease the process. For example, **<Shift>-<F10>** displays the context (right-click) menu for selected icons; pressing **<H>** afterward displays the Open With menu. From there, just press the first letter of the menu item you want. If more than one item starts with that letter, you may have to press it multiple times, followed by **<Enter>**. By renaming the menu items that begin with the same letter, you'll be able to access them more quickly.

Here's what to do: in the Registry Editor, navigate to the HKEY_LOCAL_MACHINE\SOFTWARE\Classes\Applications key. Double-click *Applications*, and then double-click the application name whose menu you want to modify. Under that key, select the *Shell* key. In the right pane, double-click the *Friendly Cache* icon. In the Edit String dialogue box, edit the text in the Value data box — this is the text that will appear on the Open With menu and Open With dialogue box. If you want to give the menu name a unique keyboard shortcut, put an ampersand (&) in front of one of the letters in the name. Be sure that no other menu items begin with the letter you pick. Click *OK* and exit the Registry. The next time you open this menu using the keyboard method, you'll see an underscore marking the letter you designated; press it to launch that application. This underscore does not appear if you use the mouse to display the menu. ■

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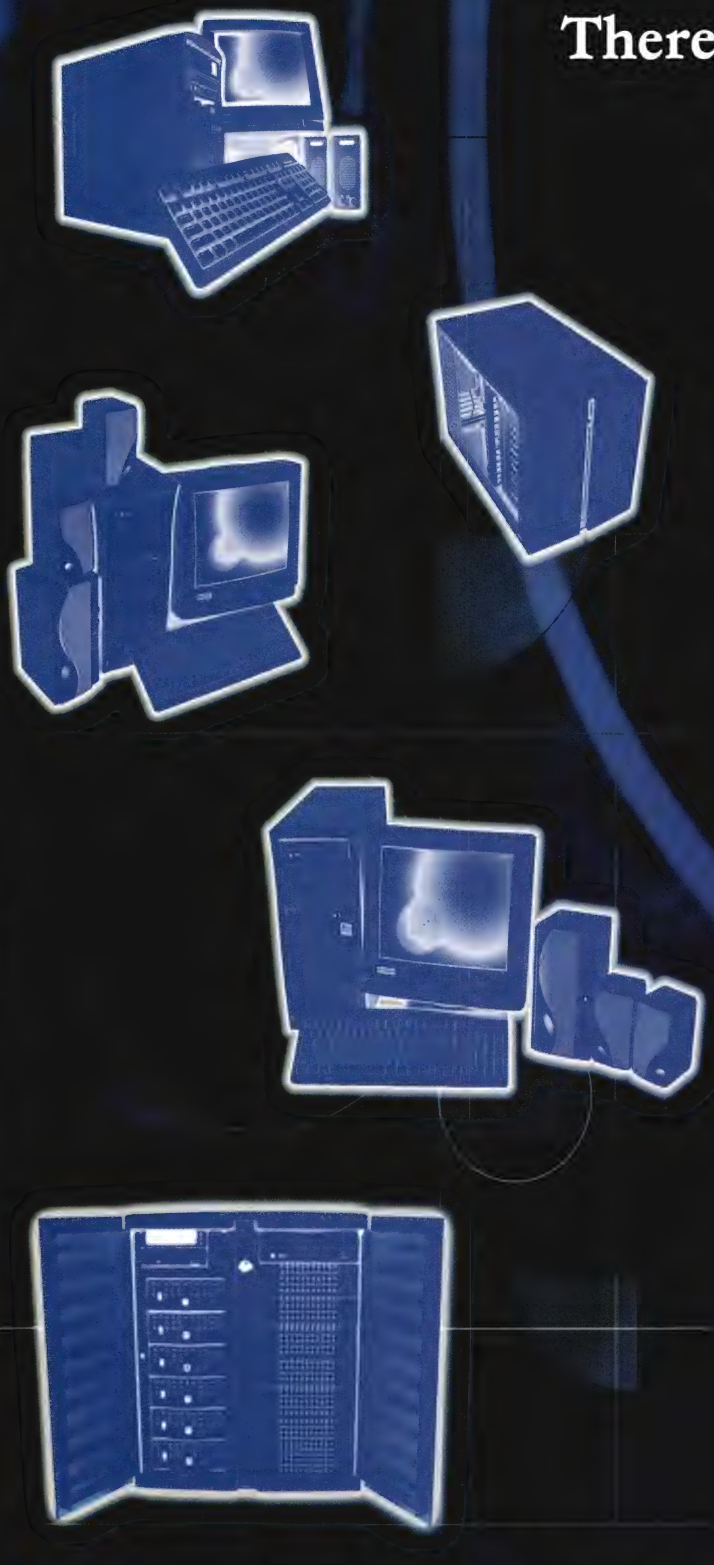

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ADN-91000001

mac OS

Wireless networking with AirPort

MATTHEW JC. POWELL

These days, a Mac that's not on a network is a very lonely beastie. iMacs and iBooks especially are designed from the ground up to be connected to other computers — how else can you share files with no floppy? But networking can be a daunting task, to say nothing of messy and expensive. Filling your home with cables gets many geek points, but won't win Good Housekeeping awards. Thankfully, iBooks, G4s and newer iMacs and PowerBooks all come ready to network with no cables at all.

In the March issue of Australian PC World, Here's How included a brief intro to wireless networking for Windows 9x-based PCs, based on the Frequency-Hopping Spread Spectrum protocol, which operates at around 1-Mbps. Apple's AirPort wireless networking system, developed in conjunction with Lucent Technologies, uses the newer Direct Sequence Spread Spectrum protocol, which operates at up to 11Mbps. You can ignore most of that techno-babble: just focus on the speed. Oh yeah, and it's dead easy.

There are two basic types of AirPort network: those that include an AirPort Base Station, and those that use the AirPort software to configure a computer as a Software Base Station. The former is more flexible, in that it allows all of the computers on the network to be positioned freely in the home or classroom, and doesn't require more than one computer to be turned on at any one time. The latter is the cheaper option, since obviously it doesn't require the purchase of a Base Station. However, it does require the computer acting as a Software Base Station to be turned on in order for any computer on the network to connect to the Internet, and it requires that computer to be located near the telephone line or LAN connection. In this tutorial, we'll show you how to set up either configuration.

1. AirPort Base Station

The first and, really, most important thing when setting up an AirPort Base Station is to ensure that you have a computer that is correctly configured to connect to the Internet, either via dial-up modem, cable modem or Ethernet connection to a LAN. You'll be copying the Internet configuration of this computer to the AirPort Base Station, and all computers using the AirPort network will share that connection. So, if it doesn't work, you're in a spot of bother. Before you start installing AirPort software, test your computer's Internet connection. If necessary, run the Internet Setup Assistant to configure your computer.

Once you're sure the computer connects correctly to the Internet, unplug your Net connection, whether it be a modem connection or Ethernet (for a LAN or cable modem), and plug it into the appropriate port on the AirPort Base Station. Then plug in the Base Station to a power supply. The series of lights on the front will glow red, then run through a sequence until eventually one green light is glowing. If you don't get that result within about 30 seconds, unplug the Base Station and try again. There may be a problem with the power point you're using, so it's worth plugging it in somewhere else if possible.

The location of the Base Station is also important, especially in a school where there may be many computers connected to the network. Obviously, it needs to be near the connection to the Net, but you should avoid putting it near metal supporting beams or sources of electrical interference.

The AirPort Admin Utility (FIGURE 1) allows you to test in real time the signal strength and noise levels for every computer connected to your AirPort. After you've got the AirPort network running, use this utility to optimise the location of the Base Station. (Incidentally, you can get a running graph of signal vs. noise by clicking on "Show History" (see FIGURE 4).

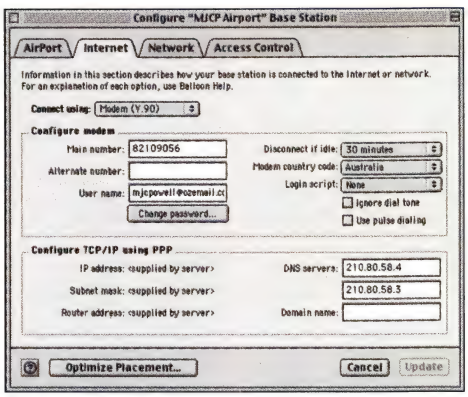


FIGURE 1: The Airport Admin Utility allows you to optimise the Base Station's placement.

Of perhaps equal importance to knowing that your Internet configuration actually works before you copy it to the Base Station, is knowing that you have an AirPort card installed. FIGURES 2 and 3 show the locations of AirPort connectors on an iMac and iBook, respectively. If your computer didn't come with an AirPort card pre-installed, it is very easy to install one following the manufacturer's instructions.

Once that's taken care of, it's time

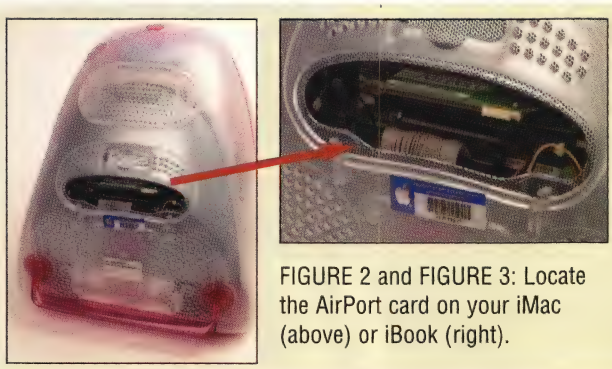


FIGURE 2 and FIGURE 3: Locate the AirPort card on your iMac (above) or iBook (right).

to install the AirPort software. After you run the installer, your Mac will restart and then run the AirPort Setup Assistant (see FIGURE 5). The initial screen of the Assistant offers three options: Join an existing AirPort network; Set Up an AirPort Base Station; and Configure a Software Base Station. You want the second option. You'll then be asked to name your AirPort network and give it a password. This is the password other users will need if they want to join your AirPort network — in a school environment, it's a good idea to keep it simple. And you'll be asked to nominate a password for the Base Station. This is the password people will require if they want to change the settings of your network — in a school environment, it's a good idea to keep it complex and change it often.

Finally, the Assistant will ask you which set of Internet settings to copy to the Base Station. If you only have one set, this is simple. If not, be very sure it's the right one. Click on "Show Details" if you're unsure.

And that's basically it. The software will configure the Base Station and you will then be offered the option of connecting to the Internet wirelessly. The Base Station doesn't include a power switch, and it's wise not to unplug it, since you may then have to reconfigure it using the Setup Assistant.

Adding computers to the network is very simple, since other clients don't even need to be configured for the Internet (they do need an AirPort card, though). Just run the installer and the AirPort Setup Assistant, but click on "join an existing network". You'll be asked for the network password. Then the Assistant will configure your AppleTalk and TCP/IP control panels to connect via AirPort. It also tells TCP/IP to obtain an IP address using Dynamic Host Configuration Protocol (DHCP), since the AirPort Base Station acts as a DHCP server and doles out IP addresses as required. Once you're within range of the AirPort Base Station (about 50m), all you need do is run a TCP/IP application such as a Web browser or your e-mail package and you will automatically share the AirPort connection. If required, the AirPort's internal modem will dial the Internet using the settings it obtained from the other computer at setup.

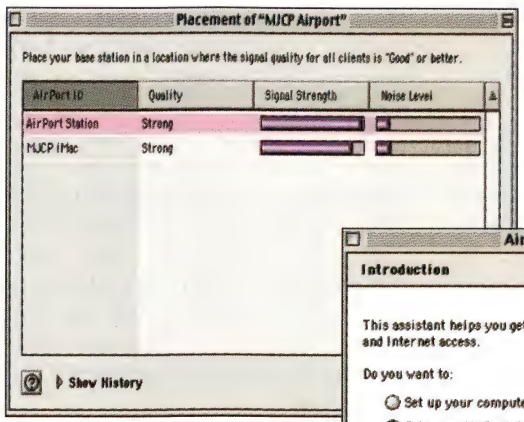


FIGURE 4 (left): Check out signal strength and noise level.

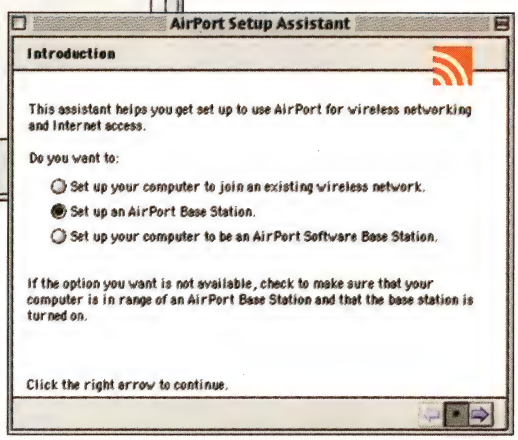
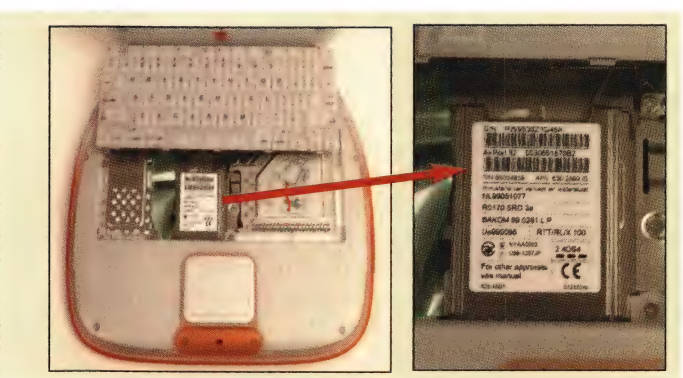


FIGURE 5 (below): This is the first step in installing the AirPort Software.

2. Software Base Station

An AirPort Software Base Station is a cheaper option for people who have an iMac or G4, and want to add an iBook and share an Internet connection. You simply put AirPort cards into both computers and run the AirPort Setup Assistant again. However, this time one of the computers will be physically wired to the phone line or LAN. This is the computer that will act as a Software Base Station, and should generally be a computer that doesn't move around much. (An iBook can just as easily be a Software Base Station but, as with an AirPort Base Station, you need to be careful about where you place it.)

As with the AirPort Base Station, a Software Base Station requires you to name your network and nominate passwords. However, the assistant will also switch on DHCP software within the Software Base Station. This means that, whenever you want to dial the Internet using another computer (say, your iBook), the Software Base Station must be turned on. When you start up a TCP/IP application on another computer, it will dial the Software Base Station's modem (if necessary) and obtain an IP address.



File sharing

AirPort lets you do more share an Internet connection. You can also share files, just as on an Ethernet network (and at similar speeds). Simply make sure that the AppleTalk control panel is set to connect using AirPort (the Assistant should already have done this) and set up your network as normal (see Here's How in January's PC World for more details). Watch for more advanced tips on using AirPort in future editions of Here's How. ■

WINDOWS 9x

Protect against catastrophic installs

Installing software is dangerous. Every time you put another program onto your system, you run the risk of breaking something that's already there. And uninstalling a new app doesn't always fix a troublesome installation, because uninstall routines seldom do their job completely. So, how do you install new software without risking disaster?

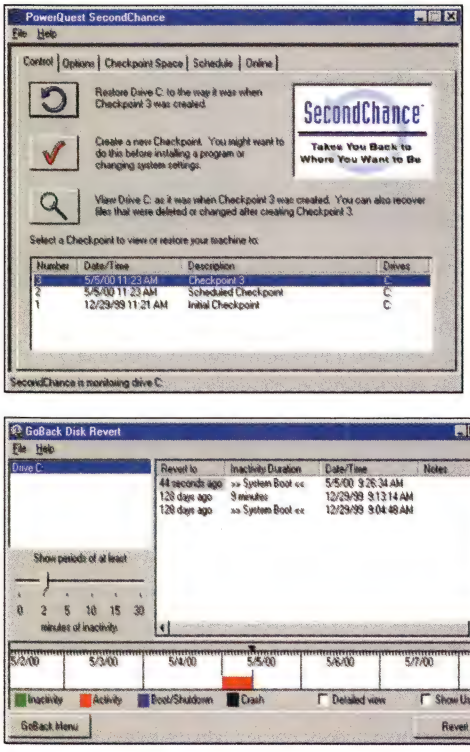


FIGURE 1: Avoid software installation trouble with SecondChance (top) and GoBack (bottom).

One way is to use PowerQuest's SecondChance (FIGURE 1, top) or Wild File's GoBack (FIGURE 1, bottom). These programs track all of the changes made to your hard drive. If an installation messes up things, either program can roll back your hard drive to an earlier condition.

A word of caution: before you use one of these programs to restore your setup, backup your data. You might want to get Windows back to where you had it last Tuesday, but you don't want to lose a week's work in the process.

If you would rather not spend money or risk installing these programs, you can simply back up the Windows Registry before installing a new piece of software. This won't protect you as well as GoBack or SecondChance, but it will let you restore the part of Windows that sustains the most damage after a bad installation.

You can backup the Registry in Windows Explorer. Select *View-Folder Options* (or *View-Options*). Click the *View* tab, select *Show all files,* and click *OK*. Now create a folder called C:\Regback. Go to the Windows folder, find the files system.dat and user.dat, then hold down **<Ctrl>** as you drag those two files to C:\Regback.

If you need to restore the Registry, you must first exit to DOS. Do this by selecting *Start-Shut Down-Restart in MS-DOS mode*. At the DOS prompt, type the following commands, pressing **<Enter>** at the end of each line:

```
attrib -r -s -h c:\regback\-.-

attrib -r -s -h c:\windows\user.dat

attrib -r -s -h c:\windows\system.dat

copy c:\regback\-.- c:\windows /y

attrib +r +s +h c:\windows\user.dat

attrib +r +s +h c:\windows\system.dat
```

– Lincoln Spector

Run programs at shutdown

What better time to scan, defrag, and backup your hard drive than when you're shutting down at the end of the day? Unfortunately, Windows doesn't provide a way to do this, so you'll have to go with third-party software.

I recommend Kill Win, a little program by BK Soft that lets you set up an icon to run one or more programs, then shut down Windows. There are two current versions of the program — one free and one shareware — both of which are available at **www.borgking.de/bk-soft**; you can get the free version off our cover CD. (Both require the Visual Basic 6.0 runtime, also on our CD).

You can use either version to run other programs automatically before closing Windows, but to do so with the free Kill Win 2.1.6, you'll have to create a batch file. Select *Start-Programs-Accessories-Notepad*. Assuming you've installed Kill Win in the C:\KillWin folder, enter the text **c:\killwin\killwin /w**. Press **<Enter>**.

On the next line, start by typing **/w**, followed by the command to run a program. For instance, if you want to scan your hard drive, type **start /w scandskw c: /n**. The "start /w" will make the batch file wait before it goes on to the next command. Press **<Enter>** to go to the next line. If you want to run more than one program, type each command on its own line, prefaced with "start /w". Finally, type **c:\killwin\killwin /s** on the last line to exit Windows.

Save the file with the extension .bat, as in Close Windows.bat, and place it somewhere convenient, such as on your Start menu. When you want to shut down Windows, select *Start-Close Windows* rather than the usual *Start-Shut Down*. When you run this batch file, you'll get an error message telling you that it can't close the DOS window while it's running the batch file; don't worry about it.

The $US15 Kill Win Pro makes running other programs before shutdown much easier. Once you have installed and launched Kill Win Pro, select the *Settings* tab. On the *Various things* tab, check *Execute another program before the execution of an action*. Directly below, select *Until this app has closed,* then *execution*.

For "Location of the app", enter the command to launch the app you want to run before shutting down Windows. For the default action, select *Shut down Windows*. Finally, click *OK*.

Now, to run your program and exit Windows, launch Kill Win Pro from the Start menu, then double-click its system tray icon. Or you can simply double-click the Kill Win Pro icon on your desktop. This shortcut, unlike the one in the Start menu, automatically runs Kill Win Pro's default action.
– *Lincoln Spector*

Securely delete sensitive files

When you delete a file in Windows and empty the Recycle Bin, the physical space that the file occupied becomes available for other files. Until the space is overwritten, however, it still contains the old data. If you are selling or donating an old computer system, you want to be sure that the new owner won't be able to recover any sensitive data that you thought was gone for good.

You may already have a program that can overwrite data so it can't be recovered. For instance, Norton Utilities comes with a program called WipeInfo, which will securely delete a file, folder or the free space on your drive. Or, with Mijenix PowerDesk Utilities 98, you can render a file irretrievable by highlighting it and selecting *File-Destroy*.

If you don't have either program, download Jetico's BCWipe from www.jetico.com/download.htm or get it off our cover CD (it's free for non-commercial users). BCWipe integrates with Windows Explorer (see FIGURE 2). To wipe a file off of your hard drive, simply right-click it in Explorer and select *Delete with wiping*. To wipe deleted files, right-click the drive and select *Wipe free space*.

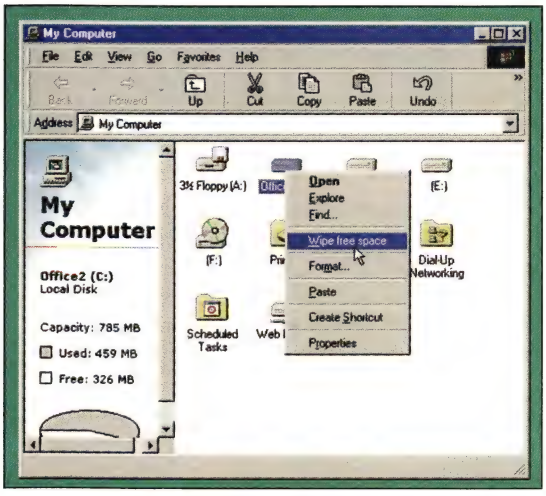


FIGURE 2: Windows doesn't completely erase files when it deletes them, but BCWipe does.

A quick-and-dirty way to overwrite deleted files is to run Windows' Defrag, which moves files around on your hard disk, thereby overwriting many sectors occupied by "ghost files". The success of this method, however, is not guaranteed, as it does not overwrite every sector.
– *Lincoln Spector*

Overcome halted defrags, part II

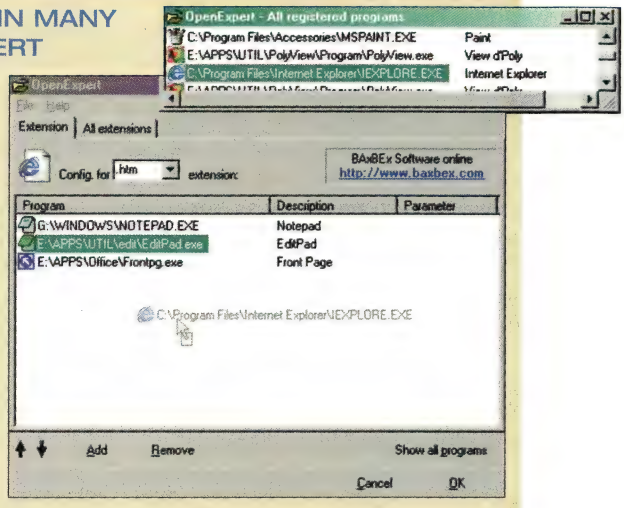
A few months ago, I offered some tips on helping Windows' disk scanner and defragger complete their jobs without freezing or starting over (see "Overcome Halted Defrags", in our February 2000 issue). Several readers responded with these additional tips:

Go away and let it run: these programs can't finish their jobs if you keep using your computer. So take a break after you start a scan or defrag. Also, if you have a screen saver or any program that's set to kick in while your system is idle, disable it temporarily.

Defrag in Safe Mode: if you boot into Windows' Safe Mode, you are much less likely to run into some program that causes a conflict with the disk scanner or defragger. To get into Safe Mode, reboot your computer. If you are using Windows 95, wait until the words "Starting Windows 95" appear, then press <F8>. With Windows 98, as soon as the boot process starts, press and hold down <Ctrl>. In either case, you'll eventually get to the Startup menu, where Safe Mode will be one of the options. ■
– *Lincoln Spector*

WINDOWS TOOLBOX

OPEN ONE FILE TYPE IN MANY APPS WITH OPENEXPERT



Want to open GIFs, JPEGs or HTML files from your browser one day and from an editing program the next? Opening a file and its application from Explorer is usually a one-file-type, one-application kind of procedure.

It's possible to dig through the myriad Explorer dialogue boxes to change your options, but who wants to do that for several file types? OpenExpert can help. This handy little utility (free to home users, $US20 for businesses) adds an "Open With" submenu to your right-click menu and makes it a breeze to configure applications. Once you've set up a few applications, adding them to the menu for other file types is a simple drag-and-drop procedure.

You can also customise the names of applications and the order in which they appear on the menu. Why didn't Microsoft think of this? Thank the people at BaxBex Software for such a great idea. You can download OpenExpert from the vendor's site (**www.baxbex.com**) or from our cover CD.

help screen

INTERNET

Command your modem with HyperTerminal

Once upon a time, connecting to an online service required an artefact called communications software. If you're a relative PC geezer like me, you may remember some of the leading titles — Procomm Plus, Smartcom and HyperTerminal. Wait a minute, that last one sounds familiar . . . yup, it still shows up in Windows under *Start-Programs-Accessories-Communications*. (The exact location may be different on your machine, but all versions of Windows from Windows 95 forward include a copy of HyperTerminal.)

Since communications programs are unnecessary for browsing the Web, downloading files or reading e-mail, you might be tempted to uninstall HyperTerminal. Don't. Although your Web browser is good for a lot of things, it can't talk directly to your modem. In addition, your Web browser isn't a Telnet client — a device that provides the most basic means of connecting to other computers (Unix servers) over the Internet — though it can launch one as a helper application.

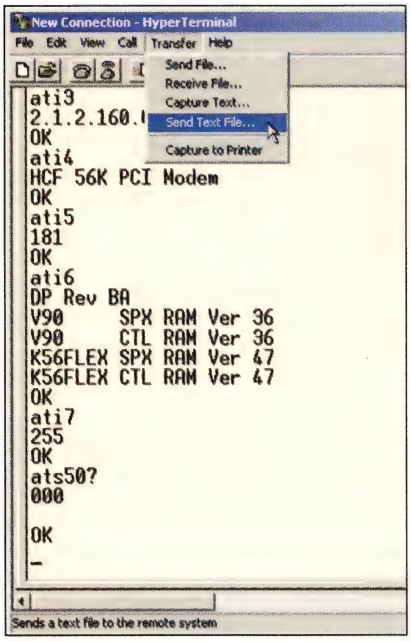


FIGURE 1: Tell your modem where to go, and how, using Windows' HyperTerminal.

In most cases, modems work just fine as long as you have all the proper drivers installed for them. On certain occasions, however, you may find yourself faced with a situation where you need to enable or disable a particular modem feature, check its firmware version number or date, or command it to hang up. Fortunately, you can perform all of these tasks by employing the scores of AT commands described in your modem's manual. If frequent disconnections or slowdowns bedevil you, you may even be able to troubleshoot the problem by issuing an AT command to query the modem for its connection status.

It's quite easy to send AT commands to the modem from the command prompt (simply click *Start-Run*, then enter **command**) by using the echo command. For example, entering **echo atz >com1** sends the atz (reset) command to whichever device is connected to COM1. Unfortunately, this simple command-line trick is a one-way affair: you won't see the OK response the modem sends back; and if the modem is actually connected to COM2, not COM1, you won't know.

HyperTerminal gives you a two-way conduit to your modem, including serial-port ISDN modems (see FIGURE 1). To create a connection to the modem, first launch HyperTerminal, then enter a name for the connection in the Connection Description dialogue box. In the Connect To dialogue box that appears next, choose the COM port to which your modem is connected from the "Connect using" list, and then click *OK*. Set the connection speed in the next dialogue box (anything up to 115200 is safe), click *OK*, and you should be connected. To issue an AT command, type the command and press **<Enter>**. Your modem should respond with "OK".

– Scott Spanbauer

Maximise new IE windows

Navigator does it, why can't Internet Explorer? When you right-click a link in either browser, one choice on the menu that pops up is to open the link in a new window. Navigator dutifully opens a window the same size as the current one. But IE stubbornly uses a smaller size by default, which means that you have to maximise the window yourself. Here's a work-around. Instead of right-clicking the link, press **<Ctrl>-N** to open a duplicate of the current window; thereafter, simply click the link. ■

– Scott Spanbauer

download of the month

ICS REMOTE DISCONNECTION UTILITY

I promise I'll stop obsessing about Windows 98 SE's Internet Connection Sharing soon — but it has changed life as I knew it on my office network. If you're similarly enamoured with the feature (which allows one system to share its Internet connection with other computers on the local network), you'll want to try out Twiga Limited's free Remote Disconnection Utility. RDU allows any computer running the shared connection to close it when it is done, and notifies other users of the impending disconnection. You can find a single 1.5MB download containing both the client and the server portions of the utility on our cover CD, or on Twiga's site (**www.twiga.ltd.uk**).

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help screen

WORD PROCESSING

Build automatic return addresses in Word

The envelope and labels dialogue box in Word 97 and 2000 (*Tools-Envelopes and Labels*) automatically fills in a return address for you. But where does that address come from? And what if it isn't the one you want to use? You can select it and type in a new address each time you use that dialogue box, but if you want to change the default address for some reason (say you move, or you've inherited the PC from another employee), you'll have to take a different route:

Select *Tools-Options* and click the *User Information* tab in the Options dialogue box. Type the new return address information in the "Mailing address" field, deleting the old address if necessary (see FIGURE 1). Then click *OK*.

Hint: you can also change the return address in the Envelope and Labels dialogue box itself, especially for a temporary change. Just be sure to click the appropriate button when asked whether to save the new address as the default after you click that dialogue box's *Print* button.

– *George Campbell*

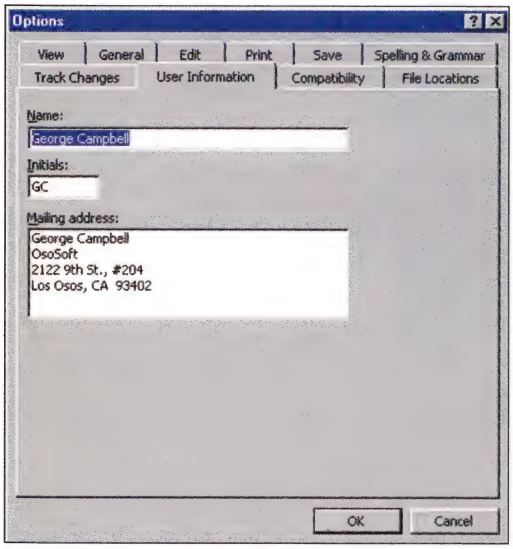

FIGURE 1: Changing Word's default return address is simple — just go to *Tools-Options*. Information is in the Options dialogue box.

Insert dates post-haste

Need a date in your document? You can insert one with a menu command (select *Insert-Date and Time*, then choose further options from a dialogue box). If you're fond of keyboard shortcuts, there are alternatives.

WORD 97 & 2000: put the cursor where you want the date and press <Alt>-<Shift>-D. There's a twist to this approach: the date you get is a dynamic date field that will update each time you load the document. To make the current date permanent, click the field once, then press <Ctrl>-<Shift>-F9. To change the default appearance of dates you have entered in this manner, select *Insert-Date and Time*, choose the desired format, click *Default*, and confirm the change.

WORDPERFECT 8 & 9: place the cursor at the desired position and press <Ctrl>-D to permanently insert the current date. To insert a date code that will automatically update itself, press <Ctrl>-<Shift>-D. (Hey, Microsoft, see how easy it can be?)

– *George Campbell*

Switch column formats mid-page

You may often need a two-column format for one part of a page and a one-column format for the rest — especially in newsletters or other graphical documents. Here's the quick, foolproof way to handle such formatting.

WORD 97 AND 2000: position the pointer at the end of the text that will precede your new format or on a blank line that will begin the new formatting area. Select *Insert-Break*. In the Break dialogue box (see FIGURE 2), select *Continuous* under "Section breaks" and click *OK*. A grey section break line will appear. Select *Format-Columns*, then choose the desired number of columns and click *OK*.

Other column options will be correctly set automatically. Repeat these steps each time you need a different column layout.

While editing, keep an eye on the grey section break lines so you don't backspace over one. If you do, press <Ctrl>-Z or click the *Undo* icon to correct the error.

WORDPERFECT 8 AND 9: no section breaks are needed to insert multiple column layouts anywhere on a page. Just select *Format-Columns* whenever you want to create a multi-column layout, and use the Columns dialogue box to set the number of columns and other measurements. To return to a single column layout, select *Format-Columns* and then click *Discontinue*. ■

– *George Campbell*

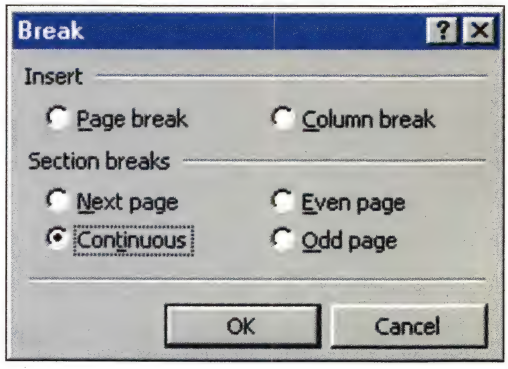

FIGURE 2: Gimme a break. Select a break option.

Delete unneeded Word backups

Word 97 and 2000 can automatically create backup copies of your open documents (select *Tools-Options-Save-Save Autorecover info every:*). It's a great idea that can save your bacon should you need to revert to a previously saved version. However, once the document is in its final form, these automatic backups just take up precious disk space. To delete them, select *Start-Find*. Type **-.wbk** in the Find dialogue's Named field, and select *My Computer* from the "Look in" list. Delete the ones you no longer need.

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SPREADSHEETS

Surprise, surprise! Excel can handle fractions

Some types of data, such as stock market quotes, normally display as fractions, not decimals. To enter a fraction in Excel, type the whole number (or integer) followed by a space, and then type the fraction, using a slash (for example, 5/8). If you type only a fraction, Excel may interpret it as a date (so it might read 5/8 as May 8). To avoid this mistranslation, enter 0, a space, and then the fraction.

stock prices.xls

	A	B	C	D
1				
2	Closing Price Per Share			
3	January	14 1/8	14 2/16	
4	February	15 3/8	15 6/16	
5	March	16 1/4	16 4/16	
6	April	14 3/16	14 3/16	
7	May	11 1/4	11 4/16	
8	June	9 7/8	9 14/16	
9	July	12 1/8	12 2/16	
10	August	13 3/8	13 6/16	
11	September	15 5/16	15 5/16	
12	October	15 3/8	15 6/16	
13	November	18 7/8	18 14/16	
14	December	20 3/4	20 12/16	
15				

Sheet1

FIGURE 1: Excel uses the smallest denominators (column B) unless you format for others (column C).

When you enter a fractional value, Excel automatically applies a fraction number format that reduces it to the smallest possible denominator. For example, if you enter 16 2/8, Excel displays the number as 16 1/4. In some cases, however, you'll want the fractions to use a common denominator. For example, you might want the value 16 2/8 to be shown as 16 4/16. To obtain this result, select your cells and choose *Format-Cells*. Then select the *Number* tab and choose *Fraction* from the Category list. Finally, select the desired number format from the Type list.

FIGURE 1 shows some examples of numbers expressed as fractions. Column B shows the numbers produced using Excel's default formatting. Column C has the same values formatted as 16ths.

You can also express fractional data using a decimal point. For instance, the number 9 4/16 could appear as 9.04. Here, the digits to the right of the decimal represent 16ths. To display values in this format, use Excel's DOLLARFR() function. It's available only when the Analysis ToolPak is installed (select *Tools-Add-ins* to install it).

The DOLLARFR() function takes two arguments: the number and an integer for the denominator. The formula =DOLLARFR(9.25,16), for example, returns 9.04.

This function is also useful for non-dollar data. So, if you work with feet and inches, you can represent 11.5ft as 11.06 (11ft, 6in) by using the formula =DOLLARFR(11.5,12). The value will then appear as '11 [feet] 6 [inches]'.

The DOLLARFR() function is for display only. You can't use the value it returns in other calculations or in charts. To perform calculations on such values, reconvert them into decimal values by using the DOLLARDE() function (also part of the Analysis ToolPak).

– John Walkenback

Unlink a chart series from its data range

Normally, an Excel chart stores data in a range. If you change the data in that range, the chart updates automatically. Sometimes you may want to unlink the chart from its data ranges and produce a static chart that remains unaffected by later changes in the data. For example, suppose you plot data generated by various what-if scenarios, and you want to save a chart that represents some baseline scenario for comparison with others.

One way to create a static chart is to copy and paste it as a picture. Activate your chart, hold down the <**Shift**> key, and choose *Edit-Copy Picture* (this option is available only when you hold down <Shift> as you select Edit). The Copy Picture dialogue box will appear. Click *OK* to accept the defaults. Then click anywhere in your worksheet and choose *Edit-Paste*.

Another way to create a static chart is to convert the range references into arrays. Select a chart series and then click the formula bar to activate the SERIES() formula. Press <**F9**> to convert the range references into arrays. Repeat this for each series in the chart. Now the chart remains formattable rather than becoming a picture. The formula bar in FIGURE 2 shows the SERIES() formula after conversion of the range references into arrays. ■

– John Walkenback

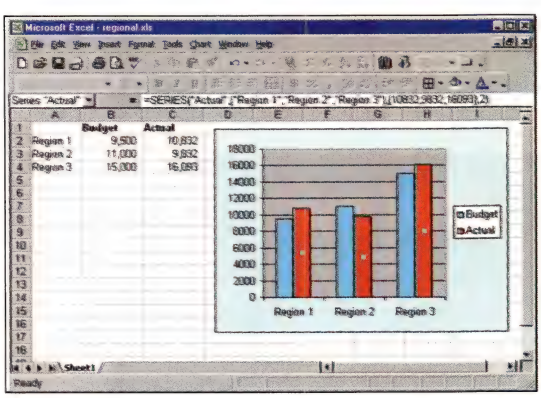
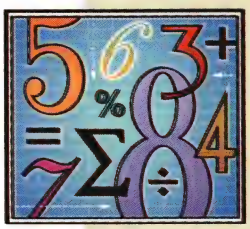


FIGURE 2: A chart is not linked to data ranges if its SERIES() formulae use arrays.

Avoid error displays

Sometimes a formula may return an error message. Usually, you'll want to know when a formula error occurs, but occasionally you may prefer to avoid the messages. You can do so by using an IF() function to check for an error. For example, the formula **=IF(ISERROR(A1/B1),"",A1/B1)** displays a blank if the division results in an error. You can adapt this technique to any operation. The original formula serves as the argument for the ISERROR() function, and it repeats as the last argument of the IF() function.



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HARDWARE

How to overcome your BIOS fear

Beneath the colourful screens and fancy pull-down menus of your PC lurks the BIOS — a bit of software that acts as the subconscious of your PC. And just as your subconscious controls your behaviour, your PC's BIOS exerts a powerful influence on the machine's performance.

Here's what you need to know to gain the greatest insight into your PC's hidden psyche.

BIOS — short for Basic Input/Output System — is the low-level software that translates instructions and data from the language of the people-friendly commands used by Windows (or DOS, or Linux, or whatever operating system you're running) into the cryptic language that controls the chips in your PC. The BIOS code resides in a chip that's located on your PC's motherboard, so it's not easy to replace.

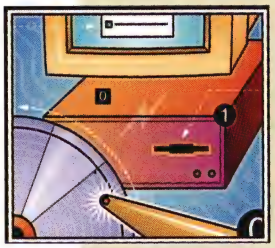
To properly govern the behaviour of your computer's chips and devices — including hard drives, memory, parallel ports, and a great many others — the BIOS needs to know what types of devices your PC contains and (where you have a choice) how you want them to function. And it must have this information before loading the operating system. To make that possible, your PC stores the relevant settings on a separate memory chip known as CMOS (which stands for Complementary Metal-Oxide Semiconductor). The program used to access and change BIOS settings is called the CMOS Setup program.

This program has settings that both beginners and veterans will find useful. You can do things as simple and obvious as adjusting the time and date maintained by your system or as complicated and obscure as altering the number of "wait states" your PC uses to coordinate the flow of data between the RAM and CPU. And since some settings here can override the corresponding settings in Windows — for example, to assign a specific IRQ to a serial port — the CMOS Setup program is the first place to look when you aren't able to resolve a hardware conflict in Windows.

Many PCs come with a motherboard manual that describes the PC's CMOS Setup program, setting by setting. If yours doesn't, check your PC manufacturer's Web site for documentation (sometimes PC makers customise the BIOS for their systems) and then the motherboard manufacturer's Web site.

faster than a speeding finger

Can you scroll faster than you can talk? No? Maybe your keyboard's holding you back. To speed things up a bit, open Control Panel and double-click the Keyboard icon. Under the Speed tab, you'll find a sliding bar labelled "Repeat rate" that's designed to set the speed of character repeats. Move the slider all the way to the right, to the side labelled "Fast". It won't make your fingers move faster, but you'll probably notice a big performance difference when you use the arrow keys to scroll through large text documents.



Play it safe

Changing CMOS settings can be useful — or dangerous. Resetting the time and date isn't hard; but if you select the wrong wait-state setting, for example, you may lock up your PC — a problem that can take many hours to fix. So use caution when working with the CMOS Setup program.

First, back up your CMOS settings — and not just as a safeguard against making unintended changes. When your PC is off, a battery on the motherboard constantly refreshes the CMOS settings. But when the battery dies — and they all do, eventually — so do the settings.

Some CMOS Setup programs come with a backup feature that writes your settings to a floppy. If yours does, use it. If not, try software that backs up CMOS settings; candidates include Norton Utilities and a number of shareware programs. CMOS settings aren't standardised, so many of these programs — including Norton Utilities — only capture certain core settings common to all PCs.

Next, make a hard copy of your CMOS settings. If your PC is connected to a printer, try pressing the **<Print Screen>** key to get a hard copy of each screenful of information in the CMOS Setup program. If that doesn't work, sharpen your pencil and start writing it all down.

Norton Utilities 2000
Price: $79
Distributor:
International Software Warehouse
URL: www.iswh.com

Get with the program

Accessing your computer's CMOS Setup program is easy; you just press a key (or key combination) when the PC starts up. Different BIOS makers use different keys — usually <Delete> or <F1>. Your monitor screen should announce which key(s) to press. If it doesn't, check your PC's documentation.

Once you reach the CMOS Setup program, you need to figure out how to get safely out of it. The main screen will list a number of submenus — like Standard, Advanced, Security and Power Management — as well as the program's exit options. Be sure to find the Exit Without Saving Changes option (or its equivalent).

You may also notice one or two menu choices that allow you to restore CMOS settings to their default values. Before using one of these, check your documentation to determine which choice restores what. One option — labelled something like "Restore BIOS Default" — may return CMOS settings to a minimal configuration

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for troubleshooting purposes, an arrangement that sacrifices performance in favour of compatibility. Meanwhile, the other choice — possibly labelled "Load Setup Default" — may restore settings to the optimal performance-oriented values they were given at the factory.

Following are just a few of the CMOS settings that you may find useful. The precise names given below may not match the settings in your BIOS — in fact, some may not even be offered in your setup program — but you should be able to find their equivalents without much difficulty. As a rule of thumb, if you don't know what a setting does, don't play with it.

HARD DISK SETTINGS: this table of settings, which in most cases is located under the Standard menu selection, holds the configuration parameters that your PC needs to recognise your hard disk. The hard disk settings table can record data for up to four drives, one for each of the four EIDE devices supported by most motherboards.

You can enter the hard disk parameters manually, but almost all PCs made in the last few years come with a hard-disk auto-detection program that reads and enters the proper configuration data into CMOS. If you like, you can run the program manually from the CMOS Setup program.

FLOPPY DISK: this option lets you select the type of floppy drive (for instance, one designed for 3.5in, 1.44MB floppies) that you have in your A: and B: drives. Check this setting if you find yourself running into floppy drive problems.

BOOT SEQUENCE: this setting determines the order in which the PC examines the drives for boot-up instructions. For example, it may begin with A: and go to C:. Or it may go from C: to the Zip drive, or from C: to A:. If you want to boot your machine from a CD-ROM, Zip, or LS-120 drive, you'll likely have to change this setting.

PASSWORD PROTECTION: you can set the BIOS to ask for a password before you boot up, but be careful with this one. If you forget the password, you may have to reset a motherboard jumper, disconnect your CMOS battery (and lose all your settings), or even buy a new motherboard.

SERIAL PORT SETTINGS: these are great places to investigate if you're having trouble installing a modem. Fixed IRQ and COM settings can wreak havoc on Windows and plug-and-play installations. For their part, serial ports may be turned on or off; so a serial port that seems dead may just be set to "disabled" in CMOS.

PARALLEL PORT SETTINGS: the preceding serial port tips apply here, too. These settings also let you select which mode — standard, bi-directional, ECP, or EPP — the parallel port uses, and they determine the speed and transmission capabilities of the parallel-port connection. Most printers manufactured three or more years ago use the slower, standard mode. Many new, full-featured printers won't function without ECP connections. Printer problems can often be traced to a parallel port with the wrong mode setting.

FAN RPM AND CPU TEMPERATURE: you can find the correct values for both of these critical parameters in the CMOS Setup program. Check the settings here periodically to ensure they are accurate.

– Kirk Steers

Build a better BIOS

Like all software, your PC's BIOS is updated continually, to correct newly detected bugs and to add new functionality. Check your PC manufacturer's Web site to see whether an updated BIOS is available for your system. An updateable BIOS is also known as a Flash BIOS.

Download the files, read the instructions in the readme file, and follow them carefully. This usually entails running a small program from a floppy disk. Granted, problems are rare; if they do occur, though, you can be left with a useless motherboard. ■

– Kirk Steers

bugs & fixes

Office 2000 SR1

Microsoft has announced the release of SR1 for Office 2000. At the moment, this is only available as an active download from their site. First download a small file (130KB), which will check your system and then — depending on your requirements — download the remaining files, which range in size from 25-46MB. The initial release of SR1 has already caused headaches for users who upgraded NT4 to Windows 2000, so wait for the update to fix these issues. Office 2000 SR-1 will appear on the PC World cover CD when Microsoft permits its distribution.

IomegaWare 2000 2.2.1

Iomega is the latest software group to squeeze the word "2000" into its software packages, with IomegaWare 2000. This release for Zip, Clik and Jaz drives has improved compatibility with Windows 2000, more bug fixes and, in some cases, improved transfer speed. The entire pack contains programs for backing up data, managing drive letters and other tools to help improve the performance of Iomega drives. Version 2.2.1 will generally overwrite previous versions without difficulty — but not everyone will be that lucky. Before you install the update, it is probably better to remove the previous versions of IomegaWare and reboot. IomegaWare 2000 2.2.1 is available on this month's cover CD, or download the 15MB file at **www.iomega.com**.

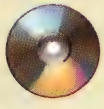
Windows 2000 — Iomega Patch

While on the subject of Iomega and Windows 2000, some users have reported the new operating system won't detect their Iomega parallel drives. A patch available at **www.microsoft.com** or from this month's cover CD will remedy the problem.

PageMill

PageMill 3.0 has a frustrating bug: when you attempt to upload HTML pages using the Newer Files or Synchronise Files setting, the HTML pages fail to upload. While the small patch fixes the problem and the frustration, it requires you to copy the files manually and overwrite the existing versions. The readme contained in the package has more details and step-by-step instructions. Download the 0.9MB patch from **www.adobe.com** or from the cover CD.

– Scott Mendham



All but one of the patches detailed here are available on this month's cover CD.

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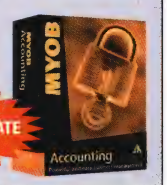

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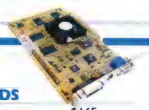

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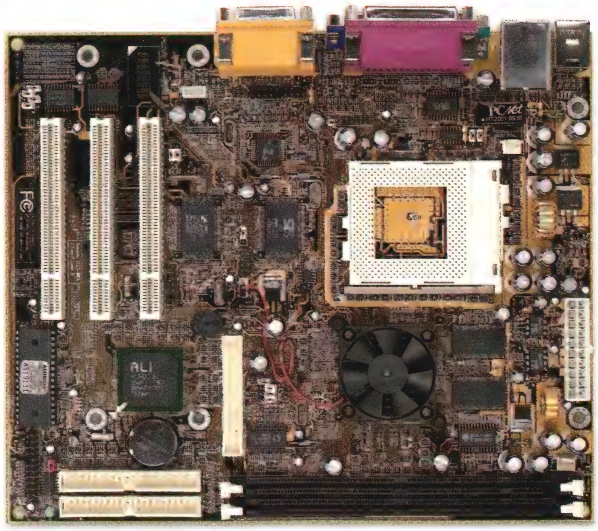

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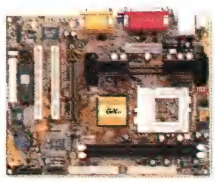

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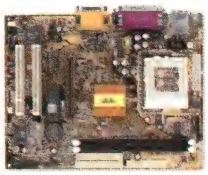

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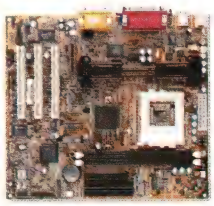

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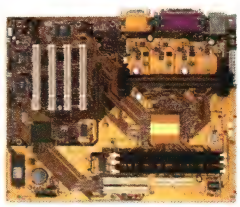

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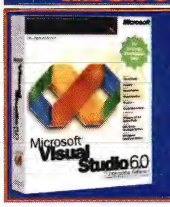

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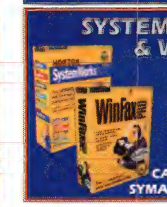

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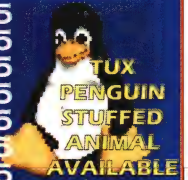

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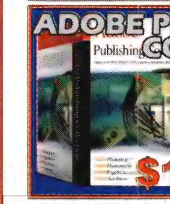

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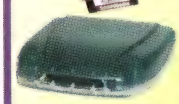

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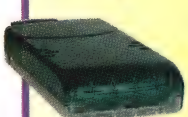

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Content Creation Winstone 2000	22.8	23.8
WinBench 99 1.1 Hi-End Disk Winmark	12400	12000
Quake3:Normal Quality (1024X768)	79.3	75.10
Quake3:High Quality (1024X768)	61	56.2

Testing Environment
CPU:AMD Athlon 500
Memory:KingMax 128MB SDRAM
VGA:Creative GeForce 256 Pro
Direct7.0a
16bit true color
Solution:1024X768
Frequency:75Hz
Hard Disk:IBM DJNA-371350 13.5 GB
CDROM:TEAC 32X CDROM
OS:Windows98 SE4.10.2222A

Source:PC SHOPPER
(2000.3/NO.16)

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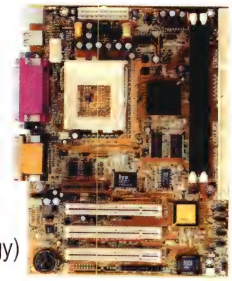

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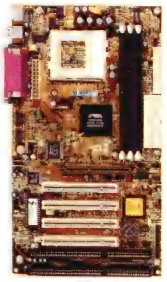

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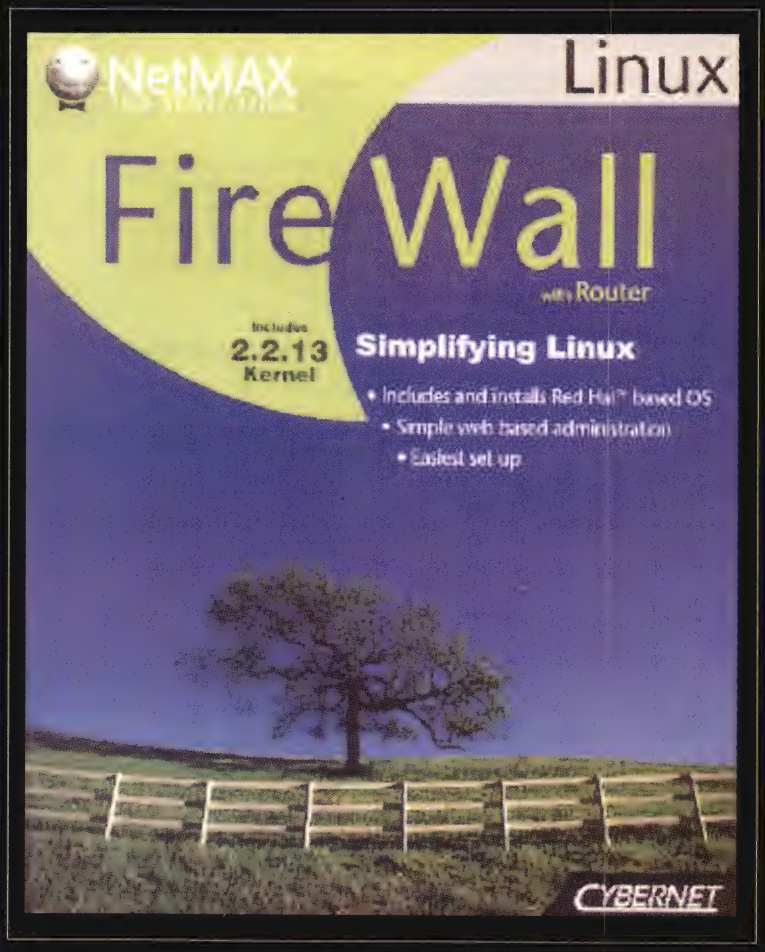
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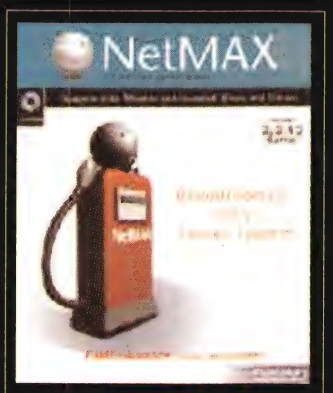
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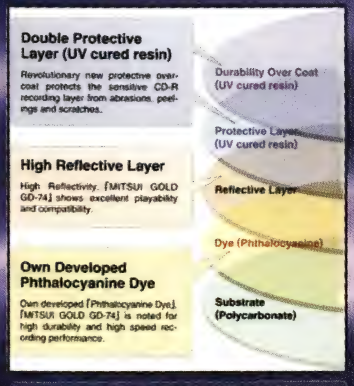

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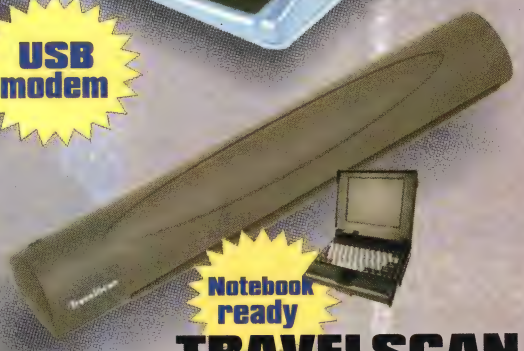

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Using 56Kbps, analog or ISDN lines across BRI connections, the Perle 833IS supports up to 16 concurrent remote users, which

makes it ideal for the medium-sized dial-in population. Scalability from 8-16 users comes with the addition of a system card, which is available with or without 56K - V.90, V.34 DSP modems.

CITRIX MetaFrame *

Meeting the needs of your Enterprise

With Citrix application server software, IT managers can instantly extend the reach of any application to any user in any location, regardless of client hardware or network connectivity

Cold Fusion Studio V 4.5 *

The fastest way to develop and deliver web applications. Offering a complete development environment with all software components providing web based resources and an international family of developers to share and/or purchase code snippets.

BorderWare
Firewall Server **Version 6.1.1**

Awarded EAL4 Common Criteria Certification

A comprehensive integrated solution for securing your internet connection. Built on a hardened operating system, it eliminates vulnerabilities and costs associated with a separate firewall and operating system. Running on standard Intel platforms, BorderWare can install on easily available hardware, which can be upgraded to grow as your internet requirements expand.

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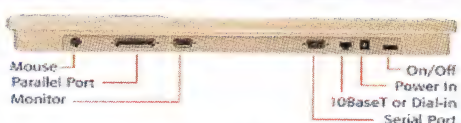

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The Thin Client Solution for Citrix Metaframe.

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Now available with protective skin.

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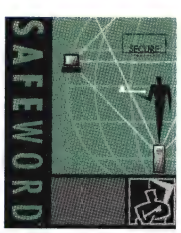
SafeWord is a system of software authentication services that allows an organization to be confident of the true identity of system users.

SecureZone is a midrange network access control gateway solution that combines robust security-backed by a graphical interface and highly secure operating system - with revolutionary ease of use management

The **SmartFilter** Web tool can substantially reduce the time and expertise required of vital support resources, the network bandwidth consumed by Internet explorers and the potential legal liability to the overall organization



Authentication

Network Security

Web Access Filter

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Fax Press 6.0 Pro -

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Simplifies Integration of Fax Communication Into a Unified Messaging Environment. FaxPress 6.0 brings many significant enhancements such as tighter integration with Outlook and MS Exchange, support for Windows 2000 and NetWare 5.0 IP, support

F-Secure Corporations popular F-PROT Professional for Windows can now be upgraded to a multi-layered virus protection system performing multiple simultaneous scans with multiple scanning engines, including on-demand and real-time scans, thanks to the ground breaking CounterSign™ technology invented by F-Secure.

F-SECURE
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With the growing trend of mobile computing within organizations and the requirement for achieving the lowest cost of ownership for IT, one critical need is the ability to access information and applications through the Web.

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Hummingbird has addressed this need in both our enterprise connectivity and business intelligence product lines by developing industry leading, centrally managed Web-based solutions that are unmatched by competitors.

MicroGram Computers

PCI Plug & Play Printer / Serial Cards

Available in either 1, or 2 port versions, these PCI bus PnP bi-directional parallel ports have an 32 byte FIFO buffer. Support is provided for DOS, Win 95 & NT. Also available, are single, dual, 4 & 8 port PCI PnP serial cards.

Cat. 2618	1 Port Printer PCI	$79
Cat. 2687	1 Port Printer ECP/EPP/SPP PCI	$83
Cat. 2619	2 Port Printer PCI	$119
Cat. 2688	2 Port Printer ECP/EPP/SPP PCI	$125
Cat. 2620	Serial/Parallel 2S/1P PCI	$119
Cat. 2616	1 Port RS232 16550 PCI	$69
Cat. 2617	2 Port RS232 16550 PCI	$99
Cat. 2674	4 Port RS232 16550 PCI	$439
Cat. 2678	8 Port RS232 16550 PCI	$669

USB Active Extension Cable

Extend the distance between your PC & USB peripherals with this 4.8m long cable which includes an active amplifer to boost the signal level. It operates in accordance with USB Specification Ver 1.1 at 12Mb/Sec. Up to 5 cables can connect in series for extensions to 24m.

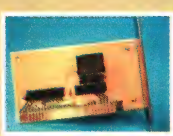
Cat. 9115 USB Active Extension Cable $74

VGA Monitor Splitters

Splitter modules enable up to 8 monitors to simultaneousy share the information of a host computer. The ideal way of providing multiple displays in training rooms, airports, stock rooms, clubs, etc.

Cat. 3070	Two Output	$269
Cat. 3055	Four Output	$336
Cat. 3056	Eight Output	$574

Diagnostic Cards



Just plug into a vacant PCI slot and turn on the computer. A LED display shows a numeric error code indicating the area of the fault. By checking the error code against the appropriate BIOS listing, the type of fault can be identified. The errorcode messages for AMI BIOS, PHOENIX BIOS and AWARD BIOS are listed in the manual. An ISA card is also available.

Cat. 3422	Diagnostic Card - PCI	$89
Cat. 3128	Diagnostic Card - ISA	$69

Multi I/O ISA Card

A versatile interface card that supports 2 FDD, 2 HDD As well as 2 16550 compatible serial ports, 1 ECP/EPP printer port and 1 games port.

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Point-of-Sale GST Bundle

Our Point of Sale bundle includes a Citizen parallel printer (as required by Digitill & Attache) or a Citizen serial printer (required by QuickPOS), a cash drawer and our very popular CCD bar code scanner. The cash drawer (Cat 8897) connects to, and is triggered from the printer, while the CCD scanner (Cat 8196) connects between keyboard and computer.

Cat. 8903	Point-of-Sale GST Bundle - Digitill/Attache	$869
Cat. 8902	Point-of-Sale GST Bundle - QuickPOS	$869

POS Customer Display

This POS customer display is driven from the serial port and has a vacuum fluorescent display with two lines of 20 characters. It is ergonomically designed with a 270 degree viewing angle. Choice of 11.25mm or 9mm high character display.

Cat. 8728	POS Customer Display (Pictured)	$379
Cat. 8907	POS Customer Display	$339

POS Cash Drawers & Citizen Printers

Compact Citizen docket printers are ideally suited to compliment these POS cash drawers which feature robust metal construction casing and a pearl white ABS fascia with a slip deposit slot. The bill tray has adjustable dividers for 4 or 5 compartments along with spring loaded bill clips. A separate coin tray has adjustable dividers for up to nine compartments. The printers feature 3 lines/sec, friction feed with 250 bytes input buffer, metal tear bar, 2 colour printing, paper end sensor & automatic paper load.

Cat. 8897	POS Cash Drawer -Epson/Star /Citizen	$195
Cat. 8898	POS Cash Drawer - RS232	$249
Cat. 5667	Citizen IDP460 Parallel Printer	$420
Cat. 5668	Citizen ISP460 Serial Printer	$420

Compact Keyboard

When desk space is at a premium an 80 key keyboard with full 101 key functionality will come in handy. It has dimensions of only 297(W) x 152(L) x 30(D) mm.

Cat. 8403 Compact 80 Key PS/2 $73

Omni-Directional Laser Scanner

An affordable, vertically mounted, Omni-Directional laser scanner, which is ideally suited to reading bar coded products at supermarket checkouts. Depth of field is 300mm.

Cat. 8521	Bar Code Laser Omni-Direct. KB Wedge	$1599
Cat. 8573	Bar Code Laser Omni-Direct. Serial	$1699

Magnetic Card Reader - KB Wedge

A bi-directional magnetic stripe reader for credit authorization terminals, POS terminals, PC's & banking terminals. Features easy keyboard wedge installation & requires no software modification, programming of I/O devices or additional power.

Cat. 8045	MCR - Track 2 KB Wedge	$349
Cat. 8681	MCR - Track 2 KB Wedge PS/2	$399
Cat. 8418	MCR - Track 2 Serial	$449
Cat. 8417	MCR - Track 1 & 2 KB Wedge	$439
Cat. 8203	MCR - Track 1 & 2 Serial	$449
Cat. 8218	MCR - Track 2 & 3 KB Wedge	$439

Infra Red Keyboard with Point Button

A handy compact sized 88 key keyboard with integral "mouse" pointing button. It is a cordless design using infra red technology. The receiver is fitted with a PS/2 Mini DIN connector.

Cat. 8750 88 Key IR Keyboard with Point Button $129

20 Key Programmable Keypad

Instant access to complex keyboard functions! This 20-key auxiliary keyboard makes it easy to save multiple keystrokes or complex commands to a single keystroke. Clear keycaps that are easy to remove allow you to create, apply and reapply custom legends. It can also be a standalone bootable keyboard for applications that do not need a regular keyboard.

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Partition Magic Version 5

New Install $108

Paint Shop Pro Version 6

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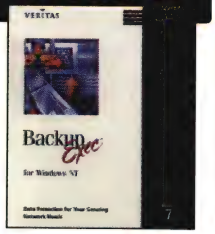

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Adobe InDesign NEW V1.5	$1299
Adobe PageMaker 6.5 PLUS	$810
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AutoCAD LT 2000 - Upgrade	$279

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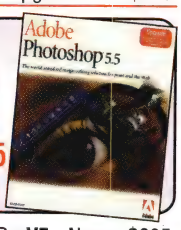

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MS WinNT W/station V4 New Inst.	$395
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Partition Magic V5	$108

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Seagate B/up **V8** - NT Server	$949
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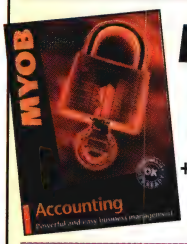

MYOB Accounting V9 **$305** +V9 inc. Payroll **$450**

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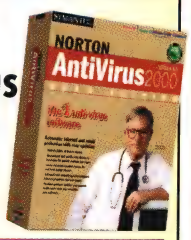

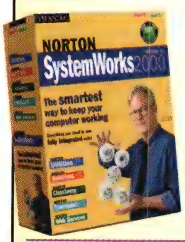

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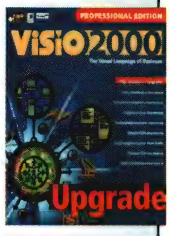

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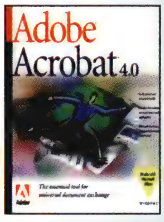

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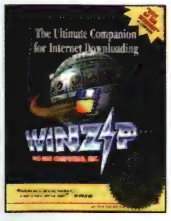

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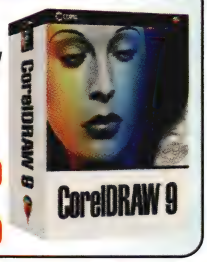

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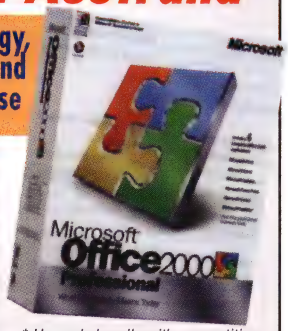

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Macase ATX case, C88 full tower 400w power supply $275.00
Macase ATX case, K10 midi tower 300w power supply $145.00
Macase ATX case, K10 midi tower 400w Leadman PSU $169.00
Macase ATX case, K510 midi tower 300w power supply $147.00
Macase ATX case, K510 midi tower 400w Leadman PSU $169.00
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Asus DIMM Riser 2, to use SDRAM in RDRAM slot $70.00
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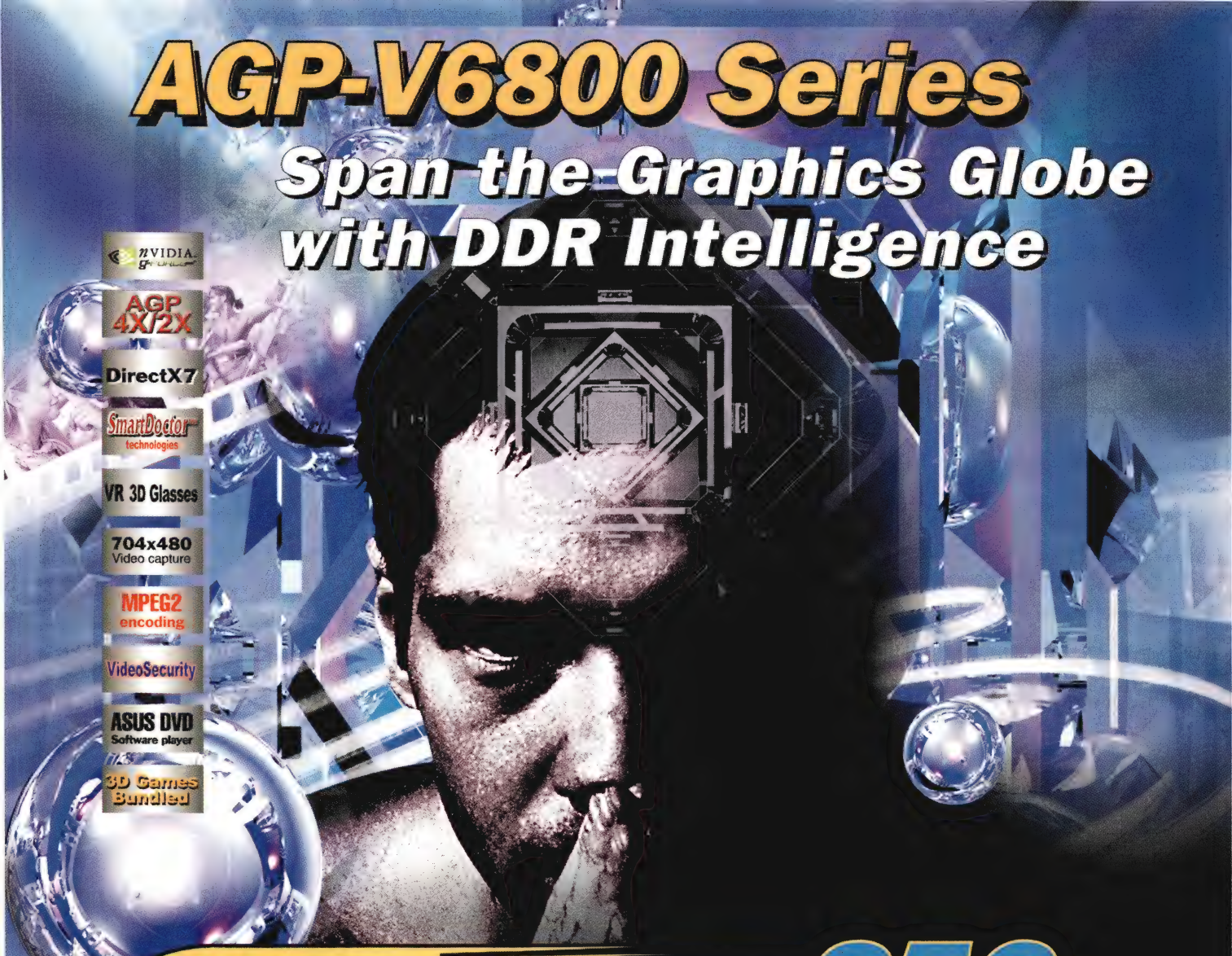

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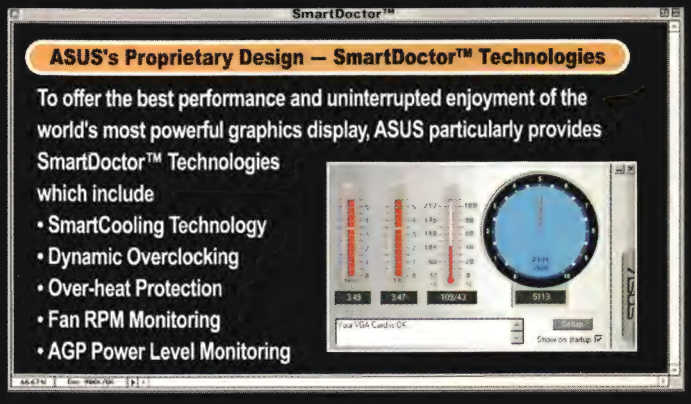

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HP Deskjet 820,850, 855, 870, 1200, 1600	K3BK	6	K11CLR	6
HP Deskjet, Deskwriter, Portable, Designjet, 300, 320	K1BK	6/9	K9CLR	12
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Canon BC-03, BC-3X (fax) BJC-210sp, 245, 255, 265	K4BK	9	K2CLR	12
Canon BC-06 photo			K23CLR	6
Canon BJ-300, 330	K9BK	7		
Canon BJC-600, 610, 620	K10BK	16	K3CLR	8
Canon BJC-800, 820, 880	K11BK	12	K4CLR	4
Canon BJC-2000 BC-20, BCI-21, BCI-21C	K12BK	9/60	K5CLR	30
Canon BJC-4000,4100,4200,4300,4550,5000,5500 BCI-21	K12BK	60	K5CLR	30
Canon BJC-4000,4100,4200,4300,4550,5000,5500 BC-20	K12BK	9	K5CLR	30
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Canon BJC-6000 (BC-32 PHOTO)			K36CLR	6
Canon BJC 7000, 7100 BC-60, BC-61	K19BK	2	K24CLR	6
Canon BJC 7000, 7100 photo BC-62			K15CLR	6
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Epson Stylus Color 200 / 820 Color 11 / 11s	K16BK	12	K7CLR	6/12
Epson Stylus 400 / 800 / 800+ / 1000	K14BK	12	K6CLR	12
Epson Stylus Color Pro / XL	K15BK	8	K6CLR	6
Epson Stylus Color 400 / 600	K17BK	12	K20CLR	6/12
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CANON BJC-2000/4000/4100/4200/4300/4550/5000/5500 BCI-21	45	19-BKL
CANON BJC-2000/4000/4100/4200/4300/4550/5000/5500 BC-20	9	18-BKL
CANON BJC-6000	6	46-BKL
HP Desk Jet 400/500 Series	6	8A-BKL
HP Desk Jet 600/660/690 Series	6	8B-BKL
HP Desk Jet 700/850C/855C/870C/890C/1000C Series	6	29-BKL
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EPSON Stylus Colour /PRO/XL	8	2-BKL
EPSON Stylus 820/colour II/IIs	12	23-BKL
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EPSON Stylus Colour 440/460/640/660/700/740/760/900	12	33B-BKL
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CANON BJC-2000/4000/4100/4200/4300/4550/5000/5500 BCI-21	3x30	17-CLR
CANON BJC-6000	3x4	47-CLR
HP Colour Desk Jet 300/400/500 Series & Olivetti!	3x12	14A-CLR
HP Colour Desk Jet 600C/660C/690C Series	3x12	14B-CLR
HP Desk Jet 850C/855C/870C/1000C Series	3x3	30A-CLR
HP Desk Jet 710/720/890 Series	3x3	30B-CLR
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EPSON Stylus Colour 200/300/400/500/600/800/850/1520	3x12	34A-CLR
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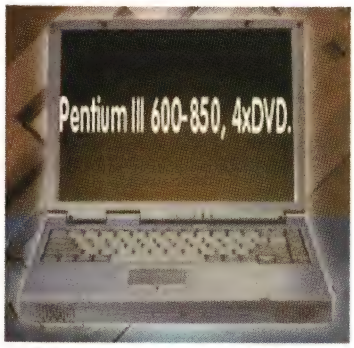

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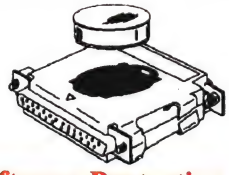

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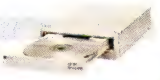

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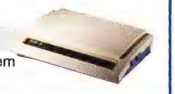

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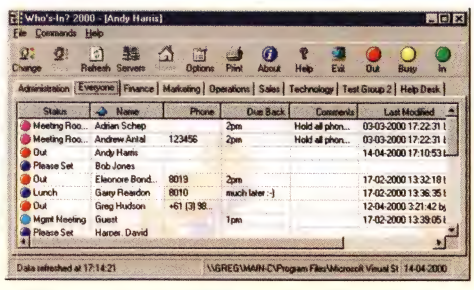

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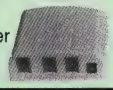
Choose EASY-CONNECT PLUS for no compromise Fax reception on any Voice line! Integrate Any Fax (or Modem) into any Telephone Line using your existing number and/or a FaxStream Duet number. Completely Automatic and Transparent operation, without Compromise. No special wiring, any device at any location.

FAXSTREAM DUET

Choose our Low Cost FAXMATE device when you wish to use your existing Fax Machine or Modem with the new Telstra FaxStream Duet service. Diverts calls made to your new Fax number direct to your Fax device and calls to your other number to your telephone. Connects in minutes to ANY telephone socket.



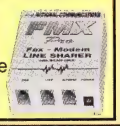
VOICE - FAX - MODEM

Choose EASY-CONNECT PRO for no compromise Fax and Modem reception on any Voice line! Automatic Voice, Fax and Modem operation all on one line using your existing number and/or a FaxStream Duet number and/or Easycall Multiple Number. Scanning Facility will allow your Fax to be used as a Scanner for your PC.

OPERATE your MODEM, MULTIPLE MODEMS, or your EFT-POS on your FAX LINE

AUTO MODEM RECEPTION

Choose FMX-PRO when you wish to fit a Modem to your Fax line and the Modem also needs to receive data calls. Directs Fax calls to your Fax and Data Calls to Modem. Barge-In protection is provided to prevent one device interrupting the other while it is in use.

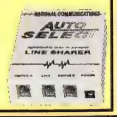


OUTGOING MODEM or EFT-POS

Choose AUTO-CONNECT when you wish to fit a Modem or EFT-POS unit to your Fax line, to make OUTGOING calls. Provides automatic connection on dialing. Other device is then locked out. Ideal for connection of Payphones, Modems and EFT-POS to any Fax, Commander, PABX or any type of Telephone line.

MULTIPLE MODEMS

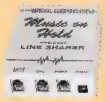
Choose AUTO-SELECT when two or more Modems need to be connected to a Fax or dedicated Modem line. Fit up to eight Modems, or seven Modems and one Fax to the same line. Incoming calls are automatically routed to any device. Barge-in protection is provided.



IMPROVE the EFFICIENCY or PROFESSIONALISM of any ordinary TELEPHONE LINE

MUSIC OR MESSAGE ON HOLD FACILITY FOR ANY LINE

No longer is this important business facility restricted to Commander or PABX systems. Simply connect any radio, cassette, digital player, or even your PC to this low cost unit and add a professional touch to any existing line!



TELEPHONE CALL TRANSFER

Now you can answer a call on one telephone and then transfer the call to another telephone fitted to the same line, using your existing telephones. You can even use your phones as an intercom. No special wiring required. Up to 8 extensions per line. Barge-in protection is also provided.

DIGITAL MESSAGE CENTRE FOR MESSAGE ON HOLD

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DOOR STATION FOR ANY LINE

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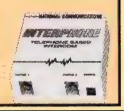
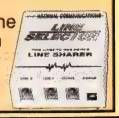
HIGH QUALITY INTERCOM SYSTEM

INTERPHONE provides LOUD, CLEAR, telephone quality INTERCOM communication for 2 to 64 telephone handsets. Simply pick up any telephone and dial the desired telephone. InterPhone uses its own telephone cable, but does not connect to a Telecom line.



TWO LINE SELECTOR

Now you can connect TWO telephones lines (Telstra, Optus, ISDN or Tie Line) to one Fax, Modem, Cordless Telephone, Answering Machine or any Telephone device. Receive incoming calls from either line. Make outgoing calls on either line.



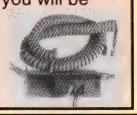
Turn ON, Turn OFF or RESET your PC, NETWORK or any ELECTRICAL device by TELEPHONE

REMOTE TELEPHONE ACTIVATOR

RTA will allow you to call in on your telephone line and SWITCH ON, SWITCH OFF, or RESET up to 6 separate electrical appliances, PCs or Networks using a touch tone telephone and PIN Number. Our Line Sharing technology means you can use it AUTOMATICALLY, on any existing line.

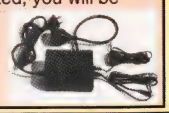
PC RESET UNIT

This low cost accessory for use with our RTA, is designed for quick and easy user fitting, direct to the back of ANY PC. Once fitted, you will be able to call in and RESET your PC from any Touch Tone Telephone, at any time, from anywhere in the world!



POWER CONTROL UNIT

This RTA accessory provides you with a simple '2 minute plug in' solution for controlling remote electrical equipment. Once fitted, you will be able to call in and TURN ON, TURN OFF or RESET the power connected to any Electrical Device from any Touch Tone Telephone.



TELEPHONE LINE SIMULATORS for TESTING, TRAINING or DEMONSTRATION of all TELEPHONE EQUIPMENT

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This compact low cost device allows any two Telephone devices to ring and communicate with each other, without the need to connect to Two Telecom lines. Save 25c per call. Ideal for the Testing, Training & Demonstration of all telephone devices. Operation is Bi-Directional.

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Provides all of the facilities of our STD device and in addition generates Australian Dial Tone, Busy Tone and Disconnect Tones as appropriate. This unit also generates ALL EIGHT TELSTRA RING PATTERNS planned for use in Australia, including FaxStream Duet, Easycall Multiple Number and Diverted Call rings.

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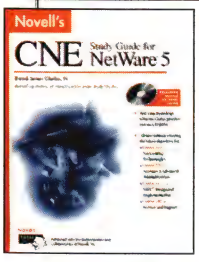
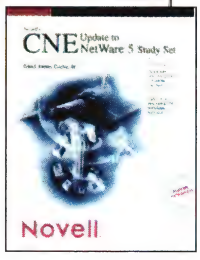


ISBN: 0764545434

RRP: $170.00

Novell's CNE Update to Netware 5 Study Set



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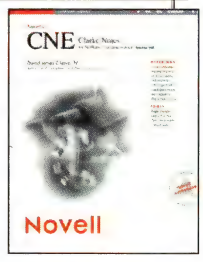

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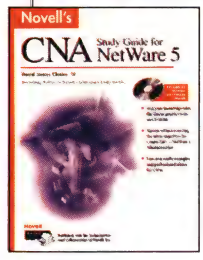

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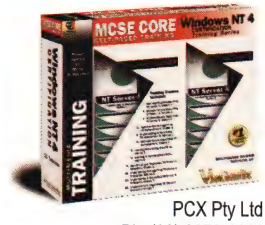

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"The most in-demand people are those with advanced skills in Windows NT" stated a recent article in the IT section of the Sydney Morning Herald. Your ticket to the hottest IT career around is to become a Microsoft Certified Systems Engineer (MCSE).

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What is an MCSE?

Microsoft Certified System Engineers (MCSE) are professionals who administer Microsoft application software and networking systems. They possess the most comprehensive knowledge of Microsoft products. Major organisations rely on their expertise to enhance the performance of their IT capabilities.

Why be an MCSE?

Microsoft Certified System Engineers are recognised throughout the world as experts. There are currently over 100,000 Microsoft Certified Professionals worldwide and demand for their knowledge and expertise is continually rising. Base salaries and bonuses offered to MCSEs are the highest among certified systems engineers of any vendor.

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Can you handle the Salary?

In Australia salary ranges from $30,000 for a person with no experience to $100,000+ for experienced individuals - and they are rising fast!. MCSEs are overwhelmingly the most sought-after Microsoft Certified Professionals in the industry, with annual bonuses that are also the highest among their peers. With LearnKey's MCSE Bundle and MasterExam, you're on the quickest road to becoming a qualified MCSE. What are you waiting for?

Is there work for MCSE qualified people?

Microsoft estimates the demand for certified employees will continue to outstrip the supply three to one for the foreseeable future! (NT Magazine, March '98) Is there work? You better believe it! According to industry sources there are approximately 30,000 unfilled IT vacancies - many for NT skills - in this country alone, and MCSE is an internationally recognised qualification!

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We've combined videos, CD-ROMs and Approved Microsoft Sybex Study Guides in our MCSE training bundles to form an integrated and comprehensive self-study program. You'll be able to see, hear, and do everything the instructor asks of you during interactive exercises and testing sessions. When you've completed your studies and hands-on exercises, you'll be ready to face the test simulations of the MasterExam.

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LearnKey's MasterExam is a single CD-ROM which simulates the content and environment of six MCSE exams. All questions on the MasterExam follow the same format used on real MCSE certification exams. The program includes three testing modes: (1) Open Book Exam, (2) Closed Book Exam, (3) Final MasterExam.

MasterExam gives you the option of practising on questions from specific exam topics, or taking a comprehensive test which covers all exam objectives for each MCSE component. Either way, the questions are as close as you'll get to the real thing before entering the testing centre.

Here's what a MCSE candidate said...

"I wish I had called you way before I signed up for those classroom courses... after the first test, NT 4.0 Workstation, I am sure that had I not bought your package I would not have passed the exam. Only your material helped me pass... the classes that I attended did not cover the material for the exam enough for me to pass. LearnKey and MasterExam did. This is the only way to go. I will be purchasing more courses for my continued education and certification needs. Any other way would be throwing money out the window."

Ted Murray - MCP (MCSE - after the next test)

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Linux training takes off

When a heavyweight like IBM supports Linux from thin client up to the S/390 enterprise server, and vendors like SAP and Oracle are porting their software to Linux, then it's clear Linux has achieved credibility status. Along with this status comes education and certification that demonstrates a person has the capabilities of a qualified Linux proponent. Education of the corporate market is also needed before Linux can reach a critical mass.

Charles Hogson, managing director of Scirocco, said, "'Propeller heads' already know Linux and now we need to educate the corporate decision-makers about Linux and what it can do, especially in the Web area. We tailor-make courses for customers and the courses are entirely dependent on what they want to do. I see the momentum for training in Linux building up in the next three months, but it is early days yet."

Tales from the tutorials

Linux is acknowledged as the world where 'propeller heads' are in their element, but even they can learn some new tricks. RedHat has recently introduced a number of Linux courses in Australia, one of which leads to Linux certification.

Ed Lenta, sales and marketing manager for LinuxPlaza in Sydney, sent two of his engineers to the RedHat certification course and was pleasantly surprised at the information gleaned from the course. "They certainly were not green when they did the course, and they had significant experience with RedHat and other Linux systems before they started.

"They have come out with Linux certification, which will give them the confidence in their own capabilities to troubleshoot for our clients, and, in turn, certification is a confidence-booster in our customers' eyes. LinuxPlaza runs a Web site where it provides, among other things, resources and support. It is imperative we have engineers who are properly skilled at the back end to provide this support."

AUUG Conference

The Australian Unix Users Group (AUUG) conference on at the end of June will have a strong Linux component and includes a number of tutorials. Frank Crawford, program chair for the conference and systems support manager at Australian Nuclear Science Technology Organisation (ANSTO), nominated two tutorials as must-attends. They are the net filter modules by the author of *Advanced Firewall for Linux*, Paul Russell, and the paper by the chief technical officer of SuSe, Dirk Hohndel.

Crawford said, "ANSTO uses Linux and says the use of Linux is growing rapidly from the bottom up into the commercial world."

While not wholeheartedly endorsing the RedHat certification, Crawford said, "The program looks pretty good." The RedHat certification takes five days in all, with four days of intensive study followed by a closed book examination to demonstrate what you can do with Linux on live equipment. The certification costs $3395 and includes the examination.

Mark White, managing director for RedHat (Asia Pacific operations), said, "The certification is equivalent to a Microsoft Systems Certified Engineer (MSCE) and was instigated in response to demand from Linux developers."

Online learning

SmartForce provides online training programs in Linux. SmartForce's e-learning offerings for the Linux open source operating system curriculum will support the Linux certification paths being defined by the Linux Professional Institute (LPI), the leading vendor-neutral Linux certification organisation, as well as RedHat's RHCE Linux certification.

Brian Kelly, general manager of SmartForce Australia, said, "The e-learning Linux courses will help system administrators and technical users with current content to develop and enhance skills necessary to meet the growing need of Linux professionals."

A variety of other learning events for Linux include streaming media SmartSeminars; online 24-hour 7-day access to mentoring by subject matter experts; and articles and white papers from SmartForce. SGI will customise and deliver courses on site for customers and is in the process of extending its Linux curriculum. In the pipeline are Building and Securing Your Internet Presence on Linux, Firewalls and Perimeter Networks Using Linux, and Web Hosting on Linux using Apache. ■

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books

on the shelf

Hacking Exposed

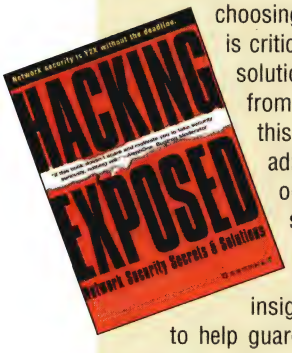
Network Security Secrets & Solutions

BY STUART MCCLURE, JOEL SCAMBRAY, GEORGE KURTZ

Hacking Exposed is a security handbook that shows how attacks are mounted on a network, and ways of defeating them. As the book is aimed at network administrators, it can get quite technical and mathematical. However, many simply explained concepts allow non-network people to gain an understanding of hacking. Many of the techniques used in recent attacks on high-profile sites are explained in detail and reveal the understanding the authors have about security issues. There is a strong focus on Microsoft products such as NT, with some detail given to Novell and Unix.

Thankfully, the authors dispel many myths and do not treat hackers as heroes or super-geeks, like many media outlets suggest. Instead, they explain the likely motivation and targets, common types of attacks and the most popular items in a hacker's toolkit. At times, it leads you to wonder if the authors were once renegade hackers before being recruited by security firms.

The underlying theme is that security is everyone's problem. For users, the book rams home a simple point — choosing a secure password is critical, and many of the solutions to attacks come from user education in this area. For network administrators, or anyone else interested in security — including hackers — this book gives great insight and knowledge to help guard against the rising threat of hacking.



– Scott Mendham

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URL: www.computing.mcgraw-hill.com

I want my MP3

BY BILL MANN

There has been a rush recently of MP3 books onto the market, and most are simply not worth the time. I want my MP3 is typical. From the outset, the author never really establishes that he fully understands MP3s.

In nearly 400 pages, the magic that converts WAV or CD music files to 10 per cent of their original size is not explained. Even the important issue of bit rate and the significant effect it has on sound quality is not covered. Instead, you are given page after page of instructions for installing MP3 software, which are repeated for more than 10 programs — with space-filling screen grabs. How many times do you need to be told to accept the licence, choose an installation folder, press next to continue? At the end of it all there are a few details about burning your own CDs — most of the CD chapter is dedicated to using just one program (no mention of Adaptec's Easy CD Creator), but there is no discussion of issues such as burning speeds, sessions, converting file formats or CD media. In addition, WinAmp is omitted entirely from the book, despite being the most popular MP3 player on download sites.

The book sticks to traditional distributions through Web sites and doesn't cover Hotline, Napster or IRC, while the portable MP3 player section is already falling behind. The Web sites mentioned are generally useful, but a visit to **www.mp3.com** could provide most of the MP3 resources covered. The book's CD has a scattering of MP3s and just nine programs on it — most of which are out of date, as the CD was burned in September 99, but the programs were downloaded in late July/early August.

In short, don't waste your money.

– Scott Mendham

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Price: $29.95
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URL: www.computing.mcgraw-hill.com

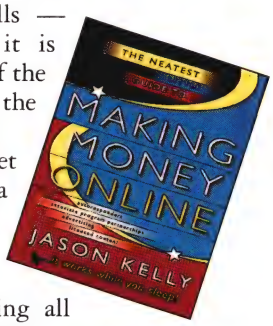
Making Money Online (The neatest little guide to ...)

BY JASON KELLY

Like many books dealing with the Internet, Making Money Online omits key information and is full of irrelevant fluff. The first half of this book has very little to do with making money: it covers topics such as buying a PC, picking your ISP and Web hosting. While this information may be of general interest, it is not the reason people are buying the book.

What's worse, the review copy was not localised, so much of the ISP Web hosting and many Web sites are tailored to the UK market. Is anyone from Australia at all interested in connecting to www.aol.co.uk, or discussing UK local timed calls for ISP access? Even if I was living in the UK, this book is not a guide to getting online or a general discussion about Web site design — it's about making money from Web sites. To spend half a book off-topic is a telltale sign of little substance.

By the time you have waded through this fat and gristle, it is apparent that tips and strategies are not well covered. There is some general discussion about a few well known techniques, but the variety and specific details are lacking. There was plenty of room in this book to discuss ways to maximise income from your site — or the associated pitfalls — but after a while it is apparent that most of the content is a plug for the author's site.



What you will get after 188 pages is a handful of Web sites, incomplete lists of resources and some general tips. Distilling all the useful information in this book will leave you with about two or three pages. Why pay $20 when you get all this in the February 2000 edition of PC World; or, visit pcworld.idg.com.au, and head to the "Web and you" section for free. Keep the money for something more helpful. ■

– Scott Mendham

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www.teleport.com/~dkossy/kooksmus.html

The Internet is a haven for anyone who thinks differently from the crowd — and some people think very differently indeed. Dedicated to the efforts of those who are obsessed with weird ideas — simple theories that will solve all of humanity's problems, which nobody has ever thought of before — the Kooks Museum is an indispensable resource for the true connoisseur of strangeness.

Here, Francis E. Dec, Esquire, will teach you about the Worldwide Computer God Frankenstein Controls and why your body is really a clever robot, controlled by your brain which is stored on the far side of the moon. You will learn why Einstein was wrong, as Alfred Lawson's theories of

Suction and Pressure, the Law of Penetrability, Equaeverpoise and Zig-Zag-and-Swirl Movement have proved in the new science of Lawsonomy. J.C. "Birdbrain" Brainbeau will explain how a head injury in World War II enabled him to conceive the 4 WAY PEACE PLAN which will save the world.

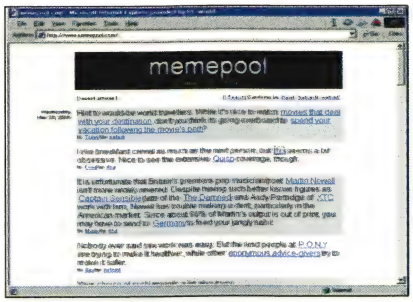
Sadly, the Curator of the Kooks Museum, Diane Kossy, has stopped maintaining it to concentrate on her rare book business (which, oddly enough, sells books by kooks). The good news, though, is that the Museum is preserved online in all its glory, and remains available to those of us who need to know THE TRUTH.

– Aldis Ozols

Memepool

www.memepool.com

Web reviewers probably shouldn't reveal all their secrets, but Memepool is just too good not to mention. This page is what's known as a Weblog, and it's a great place to find new Web sites to review. Weblogs are a class of sites that record interesting things the author has seen on the Net, with commentary and links to the best bits. Weblogs also link to other Weblogs, and have already begun to form a distinct community on the Internet.



Memepool, which is updated daily, tends to focus on interesting and amusing cultural developments, with a leaning towards the humorously inane. There are hundreds of other Weblogs, each reflecting the author's particular interests and obsessions, and finding the right one can save you hours of research by concentrating the links someone else has already found into one convenient spot.

– Aldis Ozols

Soulbath

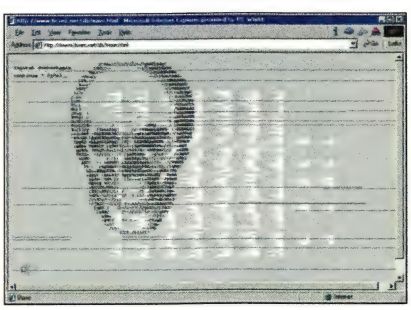
www.soulbath.com

This is digital art — not a Web page containing digitised versions of music or paintings, but a site that is a work of art in itself. Using Macromedia Flash as the canvas, the artists paint with subtle interactive images and sound.

The site will be updated to a different theme every few months — currently the theme is "greyscale Paradise", a satirical remix of the online world.

The front page, with its oddly beautiful singing menu, shows what can be done with Web technology when creativity takes precedence over greed. The online sound mixer is also a treat. Well worth checking out if you're in an "arty" mood. ■

– Aldis Ozols



editor's choice

Peacefire

www.peacefire.org

The use of filtering software for Internet censorship is an issue that will grow in importance over the next few years, and this is a site that will give you all the information that the software's manufacturers don't want you to know. With the Federal Government trying to force everyone to use filters, it's a good idea to know more on the subject, particularly as it concerns our democratic rights to communicate with each other.

Created in 1996 by high school students to protest against attempts to censor them, Peacefire has grown into a Web-wide clearinghouse of resources on all aspects of censorship software. This is a very good thing, because without sites like this we wouldn't be informed about the often sloppy, inaccurate or even deliberately restrictive blocking behaviours of many of these products. Many sites are inappropriately blocked, sometimes for political reasons, but since filter makers won't release their lists to the public, we wouldn't hear about it without investigations such as those carried out by Peacefire.

One indication of the effectiveness of this site is that Symantec has threatened legal action against it for revealing the list of blocked sites in its iGear product, showing that many were inappropriately listed. Mattel is also taking legal action against Peacefire for revealing the truth about its Cyber Patrol software. The fact that some computer companies will take legal action to prevent people from stating the truth about what their product actually does, should be of concern to all computer owners and users.

– Aldis Ozols

gadgets

Sony CyberShot →

This 2.1 megapixel camera from Sony counts as a gadget because it bends in the middle. The 10x zoom lens rotates with respect to the camera body, which is probably not as important as the fact that it is manufactured by Carl Zeiss, one of the world's most renowned lensmakers. USB connection and the ability to control almost all functions manually add to this model's attractions.

Sony
Price: $1999
Phone: 13 7669
URL: www.sony.com.au

← COMPTV-link

The collision between computer technology and television continues, and it seems but a matter of time before the two become one. Helping this convergence are the many humble devices that convert the language of one technology into signals that can be used by the other. The COMPTV-link is a small VGA-to-TV converter that requires no software or external power supply — simply connect it between the computer and the TV and you're in action.

Vision 2020
Price: $299
Phone: (03) 9558 0333
URL: www.bc.com.au

Ericsson R320s →

So, you think people who drive while chatting on their mobiles are dangerous? Be very scared, because the new generation of Wireless Application Protocol devices will soon let these people read the news when they should be looking at the road.

On the positive side, products like the R320s allow you to get the latest stock quotes or check your e-mail no matter where you are.

Ericsson
Price: $1399
Phone: 1300 650 050
URL: www.ericsson-mobiles.com.au

Birdfish →

This is a Klingon Death Ray from the early 34th Century. Well, not really, it just happens to look like one because it's an electric guitar made by German musical craftsman Ulrich Teuffel. This model, the Birdfish, is based around a vacuum-cast alloy framework holding wooden resonators, which can be swapped around to alter the sound characteristics.

Teuffel Guitars
Price: Enquire
Phone: +49 731 950 1787
URL: www.teuffelguitars.de

Spirit Set-Top Surfer →

The dreaded WebTV has finally set foot in Australia, but before you head for the hills, consider the advantages of an inexpensive, easy-to-use Net connection you can control from the comfort of your lounge. The Set-Top Surfer consists of a box connected to the TV and a wireless keyboard to give you freedom of movement, and includes 200 free hours of access through OzEmail.

Dick Smith Electronics
Price: $694
Phone: 1300 366 644
URL: www.dse.com.au

↑ PCMCIA to USB Adapter

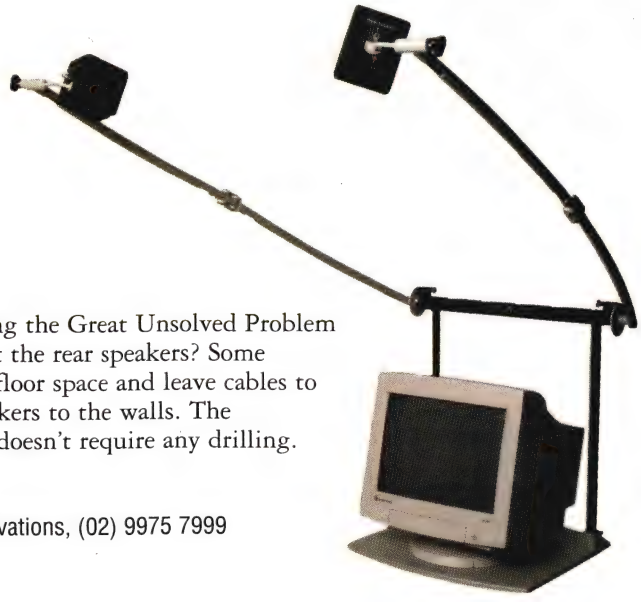
If you bought a high-powered portable computer just before the USB revolution, there's no need to despair. The ADS Technologies USB port for notebooks fits into any 32-bit Type II PCI PC Card slot with Card Bus, and gives you access to the standard pair of USB ports as found on most desktop machines.

Microgram Computers
Price: $195
Phone: (02) 4389 8444
URL: www.mgram.com.au

← Amstrad Em@iler

There are developments afoot on the home phone front. Amstrad's new Em@iler is a phone, fax, answering machine and e-mail terminal all rolled into one. This odd-looking device has been released in the UK at a low price of £80 (about $200), but makes up for it with a charge of 12 pence (about 30 cents) for every e-mail sent. If your e-mail volume is low, check it out when it hits our shores, as Amstrad intends to launch it worldwide.

Amstrad
Price: $TBA
URL: www.amstrad.com



Creative SurroundStation →

This spidery device represents an effort at fixing the Great Unsolved Problem of surround sound for computers: where to put the rear speakers? Some systems come with tripods, but these take up floor space and leave cables to be tripped over; others encourage bolting speakers to the walls. The SurroundStation provides a neat solution that doesn't require any drilling.

Creative Labs
Price: $169
Special: $155 for PC World readers at Imaging Innovations, (02) 9975 7999
Phone: (02) 9666 6100
URL: australia.creative.com

Evolva

BY BRIAN WRIGHT

Once in a while, a game comes along that defies classification. Often combining elements from different genres, they tend to be overlooked by the gaming masses, who prefer easy labels like "first-person shooter" or "real-time strategy". Evolva is one of these unique, genre-bending games that, with any luck, will cause more than a few people to sit up and take notice.

In the distant future, entire planets are being destroyed by what seems to be a mysterious parasite. Spreading like a virus from planet to planet, it's only a matter of time before the parasite reaches Earth. In order to prevent the inevitable grim outcome, Earth sends a genetic scientist to an infected planet to find out what's causing the destruction and hopefully put an end to the crisis. Orbiting safely above the planet, the scientist deploys a squad of four genetically altered warriors, called Genohunters, to the planet's surface to discover the source of the problem.

Evolva could probably best be described as a futuristic squad-based action game. You control one of your Genohunters from a third person perspective (switching between them at will) while the computer controls the other three. Commands such as "attack" or "follow" can be issued to individual squad members or the entire team with the press of a hotkey. Three windows at the bottom of the screen show the viewpoints of your computer-controlled team-mates, while the window of the hunter currently in your control is replaced with a map showing locations of key items like health and your current objective.

What makes Evolva unique is its mutation system. By absorbing genetic materials from other lifeforms, your Genohunters can acquire new abilities and mutate into more powerful warriors. These abilities include offensive ones such as fire-breathing or acid-spitting, as well as defensive ones like running and jumping. As your Genohunters mutate, they change in appearance according to the abilities they acquire — a hunter with more developed running skills may have longer legs, while a more offensive hunter may appear stronger.

In order to complete certain levels, your Genohunters will require specific abilities. For example, on one level you may find your team on one side of a wide chasm with no apparent way to get across. You would need to track down a creature with the ability to jump and absorb its genetic material, thereby acquiring its jumping skill. You can choose the direction of the mutations, increasing certain traits at the expense of others, as the situation requires.

A lot of effort has also gone into the AI in an attempt to create a realistic foreign environment. The indigenous creatures will ignore you unless you attack them, in which case they will either run away or fight back, depending on the situation. A lone creature would probably flee, while one in a pack may feel braver.

With its intriguing combination of action, strategy and character evolution, Evolva should bring a thrilling new experience to gamers everywhere.

Product: Evolva
Publisher: Interplay
URL: www.interplay.com

Metal Fatigue

BY JASON D'APRILE

The real-time strategy realm, once overflowing in cheap clones, has been relatively quiet this year. Apart from gems like Age of Kings and Homeworld, and overblown disappointments like Tiberian Sun, new games have been far and few between.

This is probably going to work to the advantage of Psygnosis' crack at the genre, Metal Fatigue. Take Acclaim's under-rated Machines, mix in some Total Annihilation, a good dose of anime and Psygnosis' usual sharp, shiny graphics, and you've got a pretty fair idea of what to expect in this game created by a developer previously only known for console games.

A few features immediately stand out. The first is the attempt to put a personalised story into the game. The overall story is a fairly standard "warring corporations fighting for alien technologies" sort of thing, but its three campaigns are wedded to the tales of three brothers. They become separated in the opening cinema and find themselves at opposing corporations.

Another is the graphics. They are incredibly impressive. The 3D terrain, seen from the overhead, isometric perspective, is smooth, detailed and realistic, with plenty of contours and variations in elevation. Lighting and shadow effects are exceptionally well done and the game engine pumps out some of the most convincing-looking 3D accelerated scenery we've seen.

The game takes place not just on planetary surfaces, but in underground mines and on bases and islands suspended above the atmosphere of the alien worlds. In the aerial levels, Combots will need to be fitted with jump jets allowing them to have the flying mobility they'll need to get around; underground, you'll have drilling units that can drill through obstacles on the map, such as solid rock walls. This drilling ability enables the player to create whole new passageways and caverns, adding

an interesting layer to the gameplay.

The units are even more impressive. While the game sports the usual array of tanks, turrets, buildings and builder units, the real stars are the Combots. You assemble these giant robots piece by piece in a factory, and the various types of arms, legs and torsos allow both fast, lightly-armed bots and heavy ones with weapons in each hand and missiles launchers on their legs.

Even better, when you destroy other Combots, you can salvage their parts and use them in your own bots. They can eject their own parts at any time — a bot can get a speed boost by losing an arm — and individual parts can be knocked off during combat.

Another interesting addition — one reminiscent of turn-based gaming — is the "pre-Build" phase. The game lets you set up your initial base as you want before the mission starts, so that players aren't rushed into using a specific base-building sequence just to keep up in the opening part of a mission.

This facet of the game should be especially interesting in multiplay, since most Net players are speed players who use the fastest base-building sequence possible. With the pre-Build mode, slower players will hopefully achieve a more equal footing at the start of the game. (A time limit will be used for this part of the game, at least in multiplayer games.)

Metal Fatigue's AI should hold some interesting surprises for players as well. Created by respected war game designer Mark Baldwin, the game has what Zono refers to as "AI Generals". Using this method, the developers can pit players against a variety of different AI personalities, each with different tactics on which to focus. One might be highly aggressive and try to strike you with powerful force, while another might prefer to use covert attacks. Depending on the level, which general the game uses might be a random selection, or just an AI type that the designers felt was best suited for a given mission.

Even better, in multiplayer games with computer players, Zono is planning to allow you to choose which general you want to use for AI players. Other than that, the AI has some learning abilities as well, so that it can alter its strategies against you depending on your tactics and reactions to situations. This way, you won't simply be facing a pre-programmed force every time you play a level, since there will always be some random element in how the computer fights you.

With a few notable exceptions, it's hard to get excited about any real-time strategy game these days. Metal Fatigue, though, is shaping up to be an appealing game — particularly for graduates of Total Annihilation and Machines. It has beautiful graphics, a solid story and accessible gameplay, and the Combots are a lot of fun to build and battle.

Product: Metal Fatigue
Publisher: Psygnosis
URL: www.metalfatigue.com

Superbike 2000

BY PETER SUCIU

Real-world course, riders and teams from the 1999 racing season, along with the game's truly impressive graphics, help rocket Superbike 2000 off the starting line and into high gear — and for those unfortunates who wipe out, into some of the most spectacular crashes ever displayed in a racing simulation.

While the average gamer probably doesn't follow the SBK circuit and might not even know the difference between a Honda and an Aprilia, the bikes included in this simulation have been painstakingly detailed, so much so that hardcore fans will see — and perhaps even feel — the differences. A full selection of rides is included from Ducati, Honda, Suzuki, Kawasaki, Yamaha and Aprilia, in conjunction with courses from England, Germany and Japan, among others. The courses feature appropriate banners — including ads, so don't worry if you start to think about motor oil — and often in the language native to the course's location. In addition, real-world riders like Eric Bostrom and Carl Fogarty make an appearance, right down to their team uniforms.

It is the game's highly detailed race settings, breathtaking graphics and rider assists that make Superbike 2000 a very playable and accessible racing sim, one that even those without knowledge of the sport can still play well and enjoy. The AI will help riders slow and brake in those sharp turns that are one of the key elements to SBK courses. Players can also set the bikes to manual or automatic transmission but, as in most racing sims, it helps to go it manual for more precise control, especially when coming off a series of tight turns.

On the downside, the game can be a bit tough with all the real-world damage and physics turned on and the assists turned off. Even experienced racing sim fans might find the game a bit too challenging — unless those dramatic crashes are your kind of thing and you don't mind being in them! Furthermore, while Superbike 2000 can be played with just the keyboard, a joystick or gamepad is highly recommended!

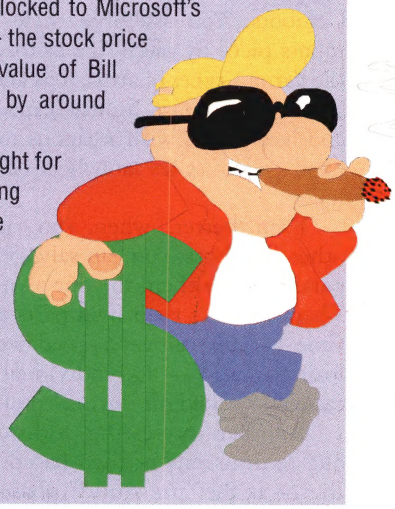
If this title was just about stunning visuals and realistic physics, it would be a solid game, but Superbike 2000 also offers one of the best multiplayer elements in any racing game. Developer Milestone took the normally console-centric two-player split-screen mode into consideration when creating this game, and the results are impressive. The high-resolution visuals hold up quite well and add an element of two-player gaming that is seldom seen on the PC. ■

Product: Superbike 2000
Publisher: EA Sports
URL: www.easports.com

Damn the almighty dollar

A few weeks before we went to press, the judge in Microsoft's anti-trust trial returned his "findings of law and order", which in essence said that Microsoft had been very very naughty and deserved a slap of some variety. Responding to the news and anticipating that justice will be tough, investors flocked to Microsoft's aid in much the way rats flock to sinking ships — the stock price dropped nearly 20 per cent, meaning that the value of Bill Gates' personal stake in the company dropped by around $A20 billion.

Before you feel too sorry for him, spare a thought for his customers. In the US, Microsoft is re-running some of the ads it made several years ago for the "Where do you want to go today" campaign. In one of them, the musical accompaniment is Mozart's "Confutatis Maledictis". In response to the familiar question, the chorus responds "Confutatis maledictis, flammis acribus addictis", or, roughly, "the damned and accursed are convicted to the flames of hell". Now that's rough justice.



Scientific or pornographic?

Have you ever known the unspeakable horror of sending off an e-mail with an attachment and then realising, after it's far too late to do anything about it, that you sent entirely the wrong attachment? Clearly, lots of people know this fear, because the US has specific laws protecting the rights of employees who write nasty letters about their bosses, then send them to a friend and unwittingly Cc the boss in on the exchange. But that's off the point.

A Web-based photo library in Sydney that specialises in scientific images recently received a request from a foreign encyclopedia for one of its images. In order that there should be no ambiguity through either an incorrect catalogue number or the broken English of the sender, a jpeg was attached of the image the encyclopedia wanted to use.

You can probably guess that the attached image was of a rather unscientific nature. Without going into too much detail, it was of a rather passionate and affectionate couple, and fruit was involved (a copy was sent to us by a tipster, but decency forbids us printing it). The administrator of the photo library sent off a bemused reply, saying, "We don't actually handle these kinds of images here, but we'd be very interested to know what part of the encyclopedia this will be in."

Sweet smell of success

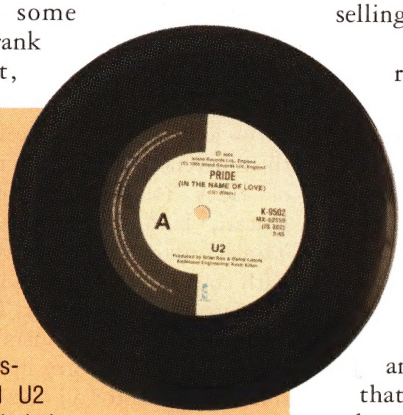
A few issues ago, we reported on Digiscents, a US company which claims to have developed a way to deliver scent-related information via the Web. Whether you realised it or not, we were a tad cynical about the whole thing and presumed that no product would ever appear on the market. Some of the more sceptical even guessed that it was all some kind of prank and that, by publishing it, we were being sucked in.

Well, there's more to it. Digiscents announced just before press time that it would be demonstrating its product at an upcoming trade show. And there are more details: the device resembles an inkjet printer cartridge and contains 128 essential "smells". You connect this to your computer and, while browsing, Web sites can transmit information to the device about which of the 128 essentials it needs to spray at you to replicate the smell of whatever's on the site. Obvious applications are for selling perfume via the Web.

We're comforted to hear that a real product may be in the offing, but now that we know it's going to be like walking through the fragrance section at a department store, we're less enthused.

Blast from the past

Prepare to feel old. A couple of years ago, Irish pop sensation U2 released a greatest hits compilation entitled "The Best Of 1980-1990 & B-Sides" (this was the title of the limited edition two-disc set, we are reliably informed). Recent discussions on a Web-based U2 discussion group included a question from a young fan (obviously born after the advent of CDs in 1983) who asked, "What's a B-side?" It must be unbelievable to some of these young whipper-snappers that, back in the mists of time, people listened to music imprinted on two-sided vinyl discs. Nowadays, the only vinyl you see in dance clubs is people's pants.



Doubling up

It's an oldie, but worth repeating. Xerox recently announced a restructuring plan that would result in a major upheaval of its workforce worldwide. As the company switches to become more services-focused and Internet-oriented, it is estimated that anywhere from 5000 to 10,000 of its employees will be looking for jobs elsewhere. Analysts believe that the job losses are designed to cut down on duplication. Boom tish. ■

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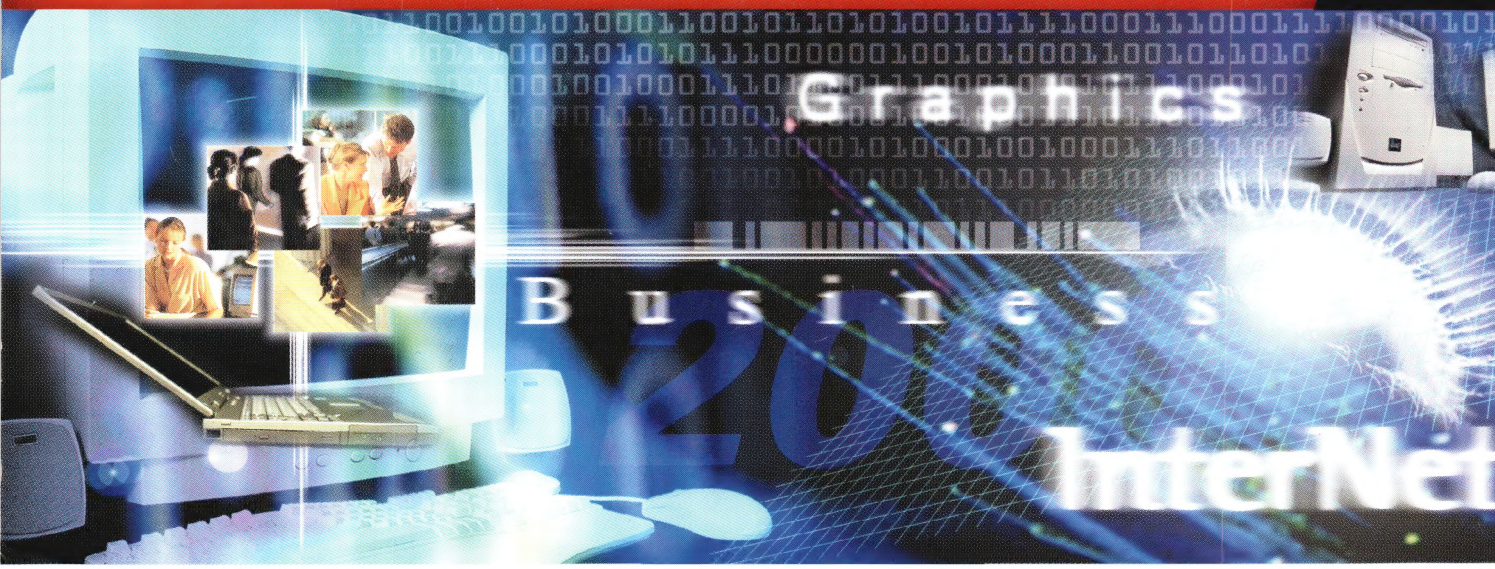

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